Product Catalog

Vertical Classroom Unit Ventilator

750 cfm to 1500 cfm

June 2013

UV-PRC003-EN

Introduction

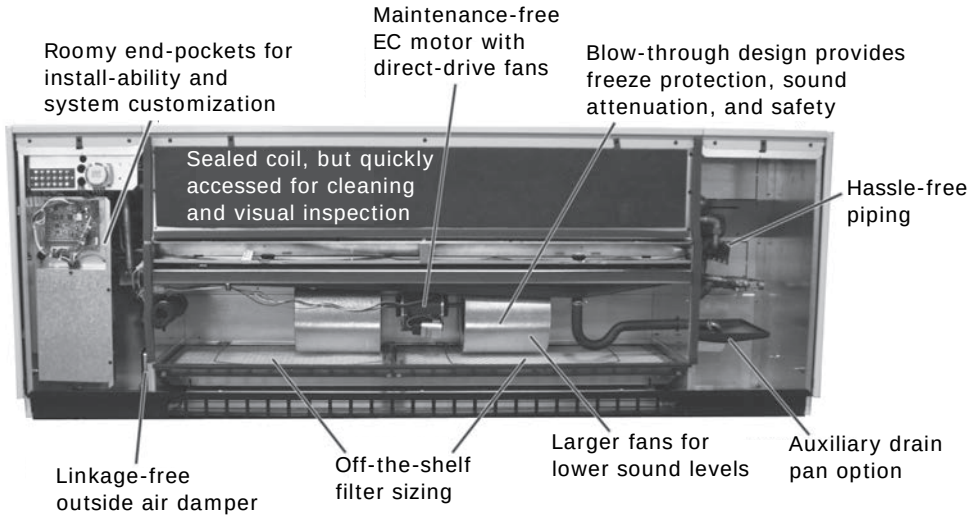
The Trane Classroom Unit Ventilator

Academic performance of U.S. students depends, in part, on the ability to create a comfortable learn-friendly surrounding. Being too hot or too cold could hinder a students ability to achieve academic excellence.

Seasonal changes, mechanical/building disrepair, and even class attendance provide real challenges to HVAC mechanical systems. The only thing consistent about today's classroom is its ability to constantly change. With this in mind, Trane introduces a NEW classroom unit ventilator design to support today's changing environment.

Figure 1. Back view of unit ventilator

Figure 2. Vertical classroom unit ventilator


Roomy end-pockets for install-ability and system customization
Maintenance-free EC motor with direct-drive fans
Blow-through design provides freeze protection, sound attenuation, and safety
Sealed coil, but quickly accessed for cleaning and visual inspection
Hassle-free piping
Linkage-free outside air damper
Off-the-shelf filter sizing
Larger fans for lower sound levels
Auxiliary drain pan option

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Features and Benefits

Fit and Finish

Equipment Size

The vertical unit ventilator delivers from 750 cfm to 1500 cfm. It is physically sized to fit the replacement or new construction application.

Cabinet Finish

The unit cabinetry is made of a durable industrial grade metal to withstand even the most rigorous classrooms. A smooth/glossy, appliance grade paint treatment increases the aesthetics of the equipment while making it durable and easy to maintain.

Access

A three panel front access of the unit ventilator is ergonomically safe for lifting/removal, and allows speedy set up during field commissioning. This design allows for the end pocket of the unit ventilator to be open while the fan (airside) section stays closed. The panel design supports a clean fit and finish while providing effortless access for filter change-out.

Top access to the unit mounted fan speed/sensor option was developed with the teacher or administrative staff in mind. Access to the sensor may be made through a lock/key, or through an easy open door.

Figure 3. Fit and finish

Install-ability, Service-ability and Maintain-ability

Spacious End Pockets

Easy access to piping and controls is made through the roomy equipment end pocket design. The coil headers and drain connections are made within the unit chassis, freeing-up valuable space in the end pockets for piping or field add-ins. This also grants a tighter seal to prevent air leakage.

The roomy end pocket design Figure 4, p. 6 allows for application requirements such as an optional auxiliary drain pan. The auxiliary pan may be placed under the factory or field piping package.

Sliding Fan Deck

Convenient access to the fan motor and fan wheels for maintenance and serviceability is made in part of the easy-slide design of the unit ventilator fan board, Figure 5. The fan board assembly offers hassle free access to the contractor or maintenance technician. As an added benefit, Trane's unit ventilator includes Electronically Commutated Motors (ECM) as standard.

Figure 4. Spacious end pockets

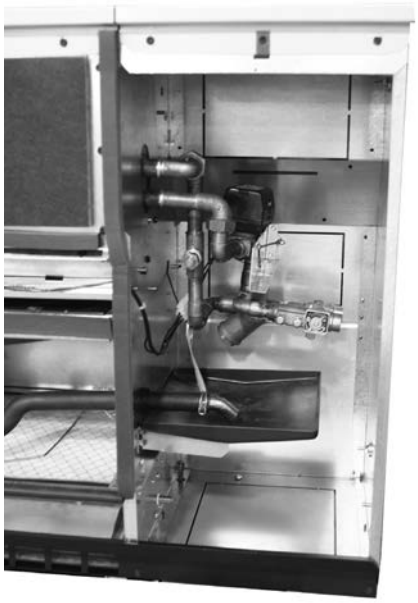


Figure 5. Sliding fan board

Energy Efficiency

Trane has a commitment to providing premium quality products that has led to the exclusive use of Electronically Commutated Motors (ECM) in all unit ventilator models. These brushless DC motors incorporate the latest technology for optimized energy efficiency, acoustical abatement, maintenance free and extended motor life. Each motor has a built-in microprocessor that allows for programmability, soft ramp-up, better airflow control, and serial communication.

- Trane units equipped with ECMs are significantly more efficient than a Permanent Split Capacitor (PSC) motor.
- Lower operating costs on average of 50 percent (versus a PSC motor).
- The Reduced FLA option allows units to ship with a nameplate FLA rating much lower than a typical ECM unit.

Filters

Trane unit ventilators utilize an off-the-shelf filter design to reduce or eliminate local stocking of filters in the school. See "General Data," p. 25 for standard filter sizes.

Note: *High efficiency options, MERV 8 and MERV 13, are available. These filters provide greater resistance and dust holding capabilities.*

Hinged Control Box

The hinged control box design maintains easy access to the electrical for connection while supporting less potential for damage on the job site from the different construction trades.

Piping

Hydronic piping for the unit ventilator may be factory installed or field provided. It fits freely inside the unit end pockets, supplying quick hook-up during the installing phase. The motorized valves include a trouble-free, pop-top allowing the maintenance or service technician access to the motor without removing the valve body from the piping package.

IAQ Features

Indoor air quality (IAQ) has become a top priority in classroom design. Giving students a healthy place to learn and develop is crucial in every school district. It is also crucial to maintaining the building's overall construction and furnishings. Several features of Trane's unit ventilator attribute to improved IAQ.

Removable Drain Pan

The unit ventilator drain pan is dual sloped for effective condensate removal. This non-corrosive pan eliminates the problems associated with leaking or standing water and is removable for cleaning.

Ease of Maintenance

Internal components such as the fan and coils are accessible for visual inspection and cleaning. Maintaining a clean system increases the efficiency of the unit and is important to good, sustainable indoor air quality.

This design also places the coils farther away from the outside air opening, virtually eliminating the potential for coil freezing and the added hassles of nuisance freeze-trips.

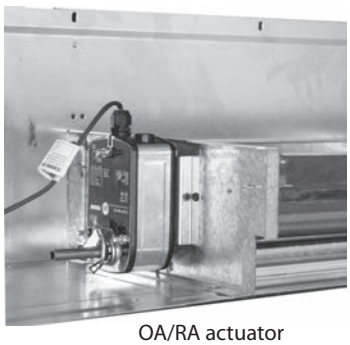
OA/RA Damper Design

The outside/return air damper is a one-piece design which is linkage free resulting in a superior air seal (see Figure 4, p. 6). This results in lower infiltration of outside air during off cycles thus lowering the risk of freezing equipment in the winter or the intrusion of humid air into the building during the summer.

OA/RA Actuator

The OA/RA actuator provides true spring return operation for positive close-off of the OA/RA damper. The spring return system of the actuator closes the outside damper if power is lost to the building. When ordered with factory controls, the actuator is a 3-point floating design. A 2 to 10-Vdc actuator is available when other than Trane controls are specified.

Figure 6. OA/RA Actuator and OA insulated damper



OA/RA actuator

OA insulated damper

Unit Filter

Each classroom unit ventilator comes equipped with a standard-size throwaway filter to support job site installation and start-up. However, the Trane unit ventilator is designed to accommodate the use of a MERV 8 or MERV 13 high capacity filter to provide greater filtration of airborne contaminants.

Dehumidification

Trane unit ventilators provide a broad range of dehumidification solutions. Active humidity control involves monitoring and managing both the dry bulb temperature and the humidity in the classroom. With this strategy, a reheat coil is placed downstream of the cooling coil to temper (reheat) the cold, dehumidified air leaving the cooling coil to avoid over-cooling the space. Reheat configurations are available in a variety of coil combinations.

Alternately, the Tracer™ UC400 or Tracer ZN520 controller can be configured to automatically reduce the fan speed at part-load conditions. This helps improve the coincidental dehumidification performance of the unit at part-load, and also lowers sound levels. To help ensure proper ventilation in the classroom at lower fan speeds, the controller adjusts the outside air being supplied to the classroom.

Economizer

One big advantage of a Unit Ventilator system is the ability to provide energy savings through an economizer cycle. During mild seasons outside air is used to provide “free” cooling, thereby, minimize or eliminate the need to run mechanical cooling equipment. To truly have an effective economizer a Unit Ventilator must be able to bring in up to 100 percent of the design airflow through the outside air damper opening. Trane Unit Ventilators are tested and certified to exceed the industry standard, as defined by AHRI 840, for economizer effectiveness. This ensures the school will realize the energy savings available through the economizer strategy.

Face and Bypass Actuator

The face and bypass damper actuator incorporates a direct couple design. It provides electronic protection against overload. A limit switch is not included, nor required as part of the design. When reaching the damper end position, the actuator automatically stops. The gears can be manually disengaged with a button on the housing.

Acoustics

Quiet systems are extremely important in today’s classrooms. Trane offers many different system solutions to balance the requirements of sound, cost, IAQ and efficiency. The Trane vertical unit ventilator takes a comprehensive approach to delivering one of the quietest units available.

Fan and Blower Motor Assembly

Several innovative ideas have gone into the quiet design of the Trane vertical unit ventilator. The fans diameters have been maximized to reduce the motor rpm and thus lower the noise, while still maintaining the cfm requirements to support ventilation and capacity requirements. The unique direct-drive fan and blower design diminishes vibration from occurring further ensuring quiet operation.

Fan Speed Control

Trane provides the capability to vary airflow for suitable applications either with three speeds or with a 0–10 Vdc input. This lowers the sound in the space and improves the dehumidification in the cooling season at part-load. With field installed controls, this is accomplished with a unit-mounted manual fan speed switch (allowing either 2- or 3-speed control) or variable speed control with a 0–10 Vdc input. ECM controls provide a soft ramp between speed changes—a significant contributor to overall quiet operation.

With the inclusion of the Tracer UC400 unit controller, the speed of the fan is infinitely varied automatically in response to the load condition in the space. The controller also will adjust the outside air being provided to properly ventilate the classroom at the lower airflow conditions.

Quiet Blow-Through Design

The Trane blow-through unit design enables additional sound attenuation by eliminating the fan noise from entering the space directly. The position of the internal components is optimized to enhance The performance and casing construction of Trane vertical unit ventilators further adds to this acoustically superior design.

Certification/Standards

Comfort, energy and IAQ are all major issues that need to be woven into today's school designs. Therefore, it is important that designers of these systems have accurate information to make system decisions. That is why the industry has developed performance standards and certification programs which ensure that the equipment information provided to the design community is correct and comparable across different manufacturers. The following list of certifications identifies the commitment by Trane to providing the highest quality equipment and information to our customers:

- **AHRI-840**
- **ETL**
- **Tested in accordance to AHRI 350 (acoustics)**
- **LonMark®**

Application Considerations

A Choice in System Design

The beauty of the classroom unit ventilator goes beyond its ability to heat and cool. The unit ventilator design provides an opportunity to create a comfortable atmosphere for living, learning and playing, while supporting energy efficiency savings. Some of the featured benefits of a unit ventilator are:

- Individual room control.
- Fresh air ventilation and filtration.
- Individual dehumidification sequences per zone.
- Energy savings solutions through economizing functions and Electronically Commutated Motors.
- A choice in heating/cooling applied systems.
- And, because the equipment is mounted directly in the living space, expense associated to installed mechanical ductwork may be avoided.

Wide Variety of Heating/Cooling Coils

Trane's unit ventilator offers a wide variety of coil configurations to be used in many design considerations.

In environments where cooling needs are of main interest, a two-pipe coil coupled with a chiller, or a direct expansion coil joined with a condensing unit may be used.

For heat specific applications, Trane offers a two-pipe hot water only unit to be combined with a boiler. Electric heat and steam options are also available for heating selections.

When there is seasonal heating and cooling, a two-pipe chilled water/hot water changeover system may be applicable to the mechanical design. This system requires a chiller and a boiler to support the changeover necessity. However, where space constraints may present a concern, the Trane unit ventilator may be equipped with a direct expansion coil for cooling, with an auxiliary electric heat coil, hot water coil, or steam coil for heating.

Four-pipe chilled water/hot water systems are also available. This system is typically applied when both heating and cooling may be simultaneously called for in the school.

Building Automation

As part of the building automation system, the mechanical HVAC system equipment may be optimized to lower energy consumption. By running only the mechanical devices that are required to support the building load at a given time of day or night, true energy consumption savings may be achieved.

Maintenance and service information through the unit sensing devices are easily defined and cured with an automated system.

With factory shipped direct digital controls, installation and start-up of the system are more simple.

Condensate

Proper condensate trapping is required for the classroom unit ventilator's with hydronic and direct expansion coils (steam coils do not require a trapped condensate setup). In a properly trapped system, when condensate forms during normal operation, the water level in the trap rises until there is a constant flow of water through the pipe. It is imperative to maintain water in the trap, and not allow the trap to dry out during heating season.

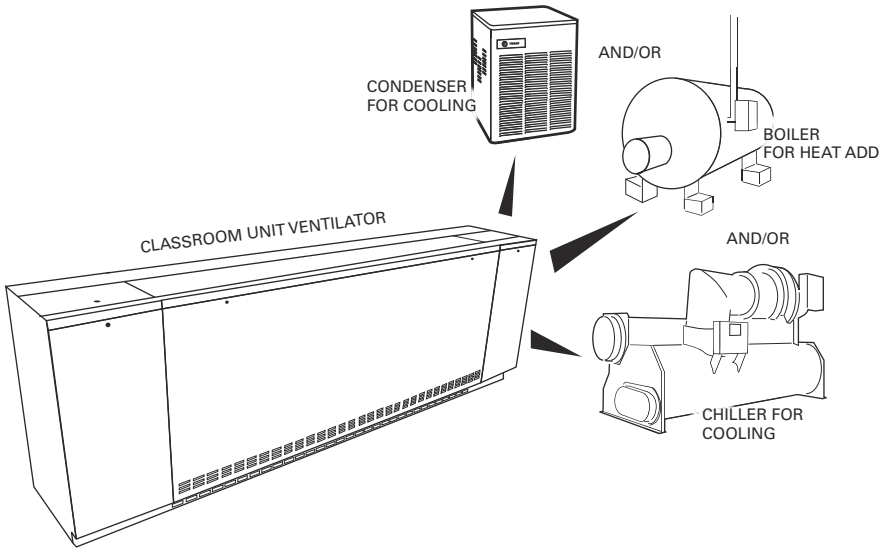
Equipment should be installed level to avoid condensate build-up around the coil.

Performance

Application of this product should be within the catalogs airflow and unit performance. The Trane Official Product Selection System (TOPSS™) will aid in the selection process for a set of given

conditions. If this program has not been made available, ask a local Trane account manager to supply the desired selections or provide a copy of the program.

Figure 7. System choice for the classroom unit ventilator



The Importance of Air Quality

Indoor air quality (IAQ) should be considered a top priority in the school environment. School institutes contain a diverse day of activities that have a potential for air impurity sources including cafeterias, art and science classrooms, vocational education areas, pools and locker rooms. Proper ventilation and filtration of these spaces can pose some challenges.

Occupant density in classrooms is much higher than that found in office or retail spaces. The amount of outdoor air required to ventilate a classroom is based predominantly on the number of students expected to occupy the space. Students also move in large groups, frequently throughout the building, resulting in widely varied thermal loads within the zones. To compound the situation, a classroom mechanical system is typically run for 9 months of the year, and vacated for 3 months (either by turning up or off the HVAC system). To increase the IAQ challenge even more, building construction techniques that help reduce energy costs, also tightly seal the school. This can lead to uncirculated/unfiltered air.

Ventilation

Ventilation is an important factor in the maintenance of healthy air. In a poor ventilated school building, fumes and vapors are not properly exhausted allowing particles to develop. A healthier building is a building where the air is exchanged more frequently and properly filtered. Through ventilation, stale indoor air is exhausted and fresh treated outdoor air is drawn into the building. The amount of ventilation air required is established by building codes and industry standards. Most building codes reference ASHRAE Standard 62—Ventilation for Acceptable Indoor Air Quality—as the minimum requirement for ventilation system design. Architects, engineers and contractors utilize this standard when determining and calculating the type of load the building environment will place on the mechanical system.

Trane Unit Ventilators Support Indoor Air Quality

The Trane unit ventilator is tested and designed to exceed ASHRAE Standard 62. This includes the use of a higher efficiency filtration to help introduce proper levels of “fresh” diluted air for contaminant removal.

Beyond the ventilation and filtration performance of the classroom unit ventilator, maintenance of the HVAC system is a must. Several enhancements placed on the Trane unit ventilator to support superior IAQ performance include:

- Coil presentation allows for ease of maintenance and cleaning.
- A dual sloped non-corrosive drain pan (removable) helps keep moisture in the system to a minimum.
- Ultra low leak damper that results in a fixed air seal of the damper assembly.
- Air exchange performance that goes beyond code while maintaining the AHRI-840 certification for economizing requirements.
- An upgrade-able MERV rated filters help reduce contaminants and increase filtration.
- Side-wall power exhaust support system to help remove the stale air from the classroom and better support the air exchange.
- Energy recovery unit ventilator to further pretreat and dehumidify the fresh air before it enters the classroom unit ventilator.
- Options for improved dehumidification at part-load, including automatic fan-speed control, face and bypass dampers, and active humidity control through reheat.

A Choice in Energy Optimization

The energy consumption of a unit ventilator system can be significantly reduced through the use of an economizer cycle. To better understand the basic function of how an outside air economizer works, it is important to fully understand how it operates.

The economizer functions by opening an outside air damper, and bringing cooler outside air into the space. The economizer cycle is controlled with a modulating damper motor, which opens at specified increments dependent upon readings from outside air sensors.

Economizers also utilize a return-air damper that closes as the outside air damper opens. Depending on the room requirements, the modulating damper motor may mix the return air with the outside air to provide the maximum energy cost efficiencies without sacrificing comfort.

When the room thermostat calls for cooling, the economizer control provides the right mix of outside and return air to cool the classroom. The equipment's airflow is generated from both fan energy and the economizing dampers. This design supports optimum ventilation and provides the greatest energy savings. As the outside air temperature rises (typically above 55°F), the outside damper closes to the minimum position, activating the second cooling stage on the room thermostat—the cooling-generating device (compressor, water pump, chiller, cooling tower). The return-air and outside air dampers modulate to support the discharged air temperature.

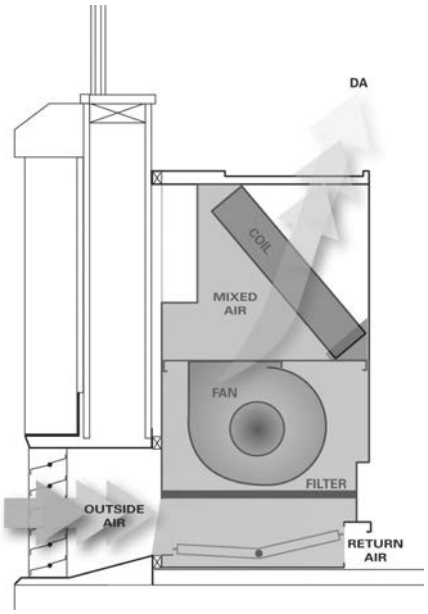
Dampers working together with the cooling coil is called integrated economizing, which allows a unit ventilator to mix outside air with return air, delivering an energy-efficient, cost-savings solution to a school.

Industry Standards

The Air-Conditioning, Heating, and Refrigeration Institute (AHRI) created the AHRI-840 standard for classroom unit ventilators to provide a consistent method of rating the unit ventilators design performance. To achieve AHRI-840 certification, the unit ventilator must be capable of providing a minimum of 80 percent of its ventilation (airflow) through the outside air economizer function (see Figure 8). This measurement ensures that the expected energy savings by the economizer is realized in actual operation.

Only AHRI-840 certified equipment has been independently tested for compliance to the minimum requirement. Trane was the first, and continues to be one of the few manufacturers that meet this certification. By meeting this certification, the designer can be assured that the Trane unit ventilator will perform with energy conservation in mind.

Figure 8. Unit ventilator economizer



Acoustics

A growing population, and an increase in economic pressure to maximize building footprints have resulted in higher building occupancies and less space to place the HVAC equipment. Often times the close proximity of the equipment—such as a floor mounted unit ventilator—may cause noise related complaints. Reducing the likelihood of these complaints requires careful planning:

- In the equipment sizing (under sizing and over sizing could increase noise level).
- And equipment placement (absorption and number of sound sources in the room greatly affect noise).

Room NC is the sum of all sounds entering the room. Its value is based on assumptions about the room's characteristics. Given the complexity of various building systems, it is extremely important to assure that the design goals (commissioning) for classroom acoustics, IAQ, and moisture control are met through all aspects of the space.

For example, it is not uncommon for a school to install unit ventilators that are manufacturer-rated for a specified airflow (cfm), but which are not AHRI-840 certified. These units may ship with a fan-speed setting that delivers a lower than specified airflow, perhaps to reduce sound levels. Without an overall building design goal, these units will be installed without delivering the specified airflow needed to support the fresh air circulation, and possibly compromise IAQ.

Note: *Unless the equipment is tested at the specified airflow, it is extremely difficult to determine whether the unit meets the specified sound level.*

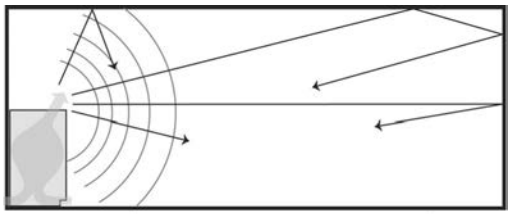
Trane's unit ventilator will not compromise air quality to support a minor reduction in airflow noise. We encourage our engineers to specify their airflow needs at full building load requirements. Fine-tuning of the speed setting may be interchanged through the unit's 3-speed fan sensor quickly and easily. This mechanical feature ensures that the equipment supplies proper cfm to support IAQ in the classroom, while giving complete control of equipment noise to the administrative staff.

Technology that Supports Acoustic Enhancements

Another solution to airflow noise is through Trane direct digital controls (Tracer UC400). With the Tracer UC400 controller, an infinitely variable speed fan control for the unit ventilator delivers the airflow output customized to support the cfm space needs. When less cfm is necessary to meet the

load of the classroom, the equipment operates at an optimum speed, keeping sound levels to a minimum. Another solution for acoustically sensitive application is the option for "Low Acoustics," which uses the ECM technology to manage the fan speeds. However, if the room temperature rises above the setpoint, the controller will switch to high speed for sustaining the space needs. As part of this strategy, ventilation must also be considered. The Tracer UC400 controller will reposition the outside air damper to confirm the minimum outside air cfm is met at both operating conditions. This setup allows the unit ventilator to meet the space comfort condition, while providing a lower sound level and proper ventilation.

Figure 9. Equipment placement



Ventilation for Acceptable IAQ

Supplying proper ventilation to a classroom is challenging. The various rooms that make up a school are forever changing in their proper ventilation needs. Building occupants and their activities generate pollutants that heighten the ventilation requirements. And because of this intermittent occupancy, the ventilation frequency of a classroom is constantly on the move.

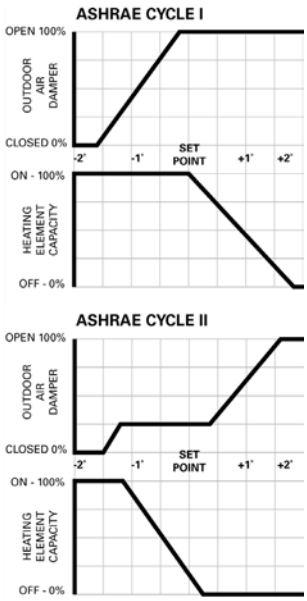
Ventilation systems dilute and remove indoor contaminants, while mechanical heating and cooling systems control the indoor temperature and humidity. Supplying an adequate amount of fresh air to an occupied classroom is necessary for good indoor air quality. IAQ should be considered a top priority in the school environment because children are still developing physically and are more likely to suffer the consequences of indoor pollutants. For this reason, air quality in schools is of particular concern. Proper conditioning of the indoor air is more than a quality issue; it encompasses the safety and stewardship of our investment in the students, staff and facility.The beauty of a classroom unit ventilator is its ability to provide heating, cooling, ventilation and dehumidification as a single-zone system.

ASHRAE Control Cycles

There is a variety of control systems available today in unit ventilators. The exact method of controlling the amount of outside air and heating capacity can vary. However, all systems provide a sequence of operation designed to provide rapid classroom warm-up and increasing amount of ventilation air to offset classroom load.

To help supply proper ventilation to these fluctuating heat gains, the Trane unit ventilator is designed to provide rapid classroom warm-up and increasing amounts of ventilation air to offset classroom overheating.

Figure 10. ASHRAE Cycle graph



ASHRAE Cycle I

All standard unit ventilator cycles automatically close the outside air damper whenever maximum heating capacity is required. As room temperature approaches the comfort setpoint, the outside air damper opens fully, and the unit handles 100 percent outside air. Unit capacity is then controlled by modulating the heating element capacity.

ASHRAE Cycle I is typically used in areas where a large quantity of outdoor air is required to offset the air being exhausted to relieve the room of unpleasant odors and particles.

ASHRAE Cycle II

ASHRAE Cycle II is the most widely used ventilation control. Similar to Cycle I, the outside air damper is closed during warm-up. But with Cycle II, the unit handles recirculated air through the return air system. As temperature approaches the comfort setting, the outside air damper opens to admit a predetermined minimum amount of outside air. This minimum has been established by local code requirements and good engineering practices. Unit capacity is controlled by varying the heating output. If room temperature rises above the comfort setting, the heating is turned off and an increasing amount of outside air is admitted until only outside air is being delivered.

ASHRAE Cycle II is a very economical control sequence often referred to as integrated economizing. This design supports optimum ventilation and provides the greatest energy savings. This is further proof of why AHRI-840 certification is important in minimizing energy consumption through economizer performance.

Freeze Protection

The most important advantage the Trane blow-through design provides is additional protection against coil freeze-up. In contrast, draw-through configurations allow little mixing of the return and outside air stream while locating the coil very close to the outside air inlet. This process creates “cold spots” on the coil which could lead to coil freeze-up.

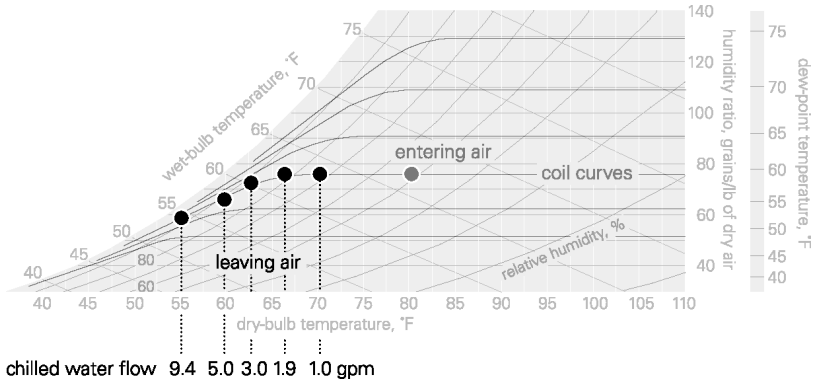
With a blow-through design, face and bypass with isolation valve control is not necessary to provide proper freeze protection to the unit vent. The placement of the coil above the fan allows enough space for the coil to avoid “cold spots” that could cause freezing.

Constant Volume System

A typical unit ventilator is a constant-volume, variable-temperature device. It uses a constant fan speed and modulates water flow through a chilled water coil to maintain the dry bulb temperature in the space based off of a setpoint. Outdoor air is introduced at the back of the unit ventilator, and distributed with the supply air. At design cooling load conditions, a system controlled in this manner typically has a leaving air temperature that is cold enough (and, therefore dry enough) to sufficiently dehumidify the space, but its ability to dehumidify can decrease significantly at part-load conditions.

When the sensible load in the space decreases (part-load), the constant-volume system responds by raising the dry-bulb temperature of the supply air. In a chilled water unit ventilator, this is accomplished by modulating a valve to reduce the rate at which water flows through the coil. Figure 11 shows how this affects the supply air leaving the coil—the warmer coil surface that results from less water flow provides less sensible cooling (raising the supply air temperature) and removes less moisture from the passing air stream.

Figure 11. Part-load dehumidification with modulated chilled water



The sensible cooling capacity of a constant volume system decreases to match the smaller sensible cooling load. Any latent cooling (dehumidification) capacity is purely coincidental, whether the cooling-coil medium is chilled water or refrigerant. As the load diminishes, the system delivers even warmer supply air. Some dehumidification can occur in this situation, but only if the sensible load is high enough.

Some designers attack this problem by oversizing the unit ventilators. This does not solve the problem; in fact, it can make the situation worse. Increasing the capacity of the unit ventilator may also require increasing the supply airflow. A higher-than-necessary supply airflow results in warmer supply air and, in non arid climates, less dehumidification. It's important to understand, this is not just a unit, coil, or fan-sizing challenge. Rather, it's an issue of properly controlling the system in a manner provides sufficient dehumidification at all operating conditions. Proper dehumidification with terminal units is a matter of *proper control*.

Active Humidity Control

A common method used to address this part-load humidity control challenge in a constant-volume system is active humidity control through supply air tempering (reheat). Active humidity control involves monitoring and controlling both the dry bulb temperature and humidity in the occupied space. Whenever the space humidity is below the preset upper limit (typically 60 percent relative humidity), the system operates just like a normal constant-volume system. However, if the space humidity reaches or exceeds the upper limit, the cooling coil control valve is driven open regardless of the need for sensible cooling in the space. The coil over-cools the air, increasing the dehumidification capacity of the system.

With this control sequence, a reheat coil is placed downstream of the cooling coil to temper (reheat) the cold, dry air leaving the cooling coil in order to avoid over-cooling the space. The key to cost-

effectively applying an active humidity control system is to use reheat only when it is needed. This requires the sensing of both the humidity and temperature in the occupied space.

When the space humidity falls below the upper limit, the system returns to the standard cooling mode and again operates as a traditional constant-volume system.

Basic components of Trane's reheat system, include a **(1)** classroom **unit ventilator** with a main coil and an auxiliary coil downstream, **(2)** the **Tracer ZN520 digital controller**, and **(3) two sensors**, one for the temperature and one for relative humidity. Sensors may be located in the zone, or in the return air stream.

If after hours operation is required, the addition of a building automation system (BAS) such as Tracer Summit™ is recommended to coordinate the chillers, pumps, boiler and unit ventilators. It also assures proper operation of the exhaust fans.

Reheat may come from new energy (electric resistance heat or boilers fueled by gas or oil) or recovered energy.

Recovered energy reheat refers to the process of salvaging or transferring energy from another process within the facility. In this case, the recovered energy is the by-product of a cooling process which would normally be rejected or wasted. A common example may include a plate and frame heat exchanger in the condenser water loop of a water-cooled chiller system.

Automatic Fan-Speed Adjustment

Reducing the fan speed (supply airflow) at part-load conditions is a way to improve the coincidental dehumidification performance of a unit ventilator. The Tracer ZN520 digital controller can be configured to automatically reduce fan speed when the sensible load is decreased, Figure 12, p. 18. At full load, the fan operates at high speed and the control valve's flow is wide open. As the cooling load decreases, the controller modulates the valve to throttle the rate of chilled water flow through the coil. At some point, based on valve position, the unit controller switches the fan to low speed. Less airflow means that colder supply air is needed to maintain the target space temperature. The control valve opens allowing the coil to remove more moisture from the passing air stream.

The controller will also adjust the outside air damper to help properly ventilate the classroom at the lower fan speed condition.

Face and Bypass Dampers

Face and bypass control is a common and accepted method of capacity control.

The face and bypass damper, consists of a single blade installed immediately upstream of the cooling coil. The bypass is sized to have the same pressure drop as the cooling coil so that a constant air quantity can be maintained at all times during system operation.

Bypass control maintains the dry bulb temperature in the space by modulating the amount of air flowing through the cooling coil, thus varying the supply air temperature to the space. As the face and bypass damper begins to close some of the outside/return air mix is diverted around the coil and mixed with air coming off the coil to obtain a supply air temperature that is proportional to the reduction in space load. Because the chilled water valve remains wide open, the portion of the air passing through the coil is dehumidified further, improving part-load dehumidification.

However, face and pass control does not actively control space humidity. It still allows the space humidity level to rise at part-load, often higher than desired.

For more information on various methods for improving dehumidification performance of unit ventilator systems, refer to Trane "Dehumidification in HVAC Systems" application manual SYS-APM004-EN.

Figure 12. Face and bypass damper

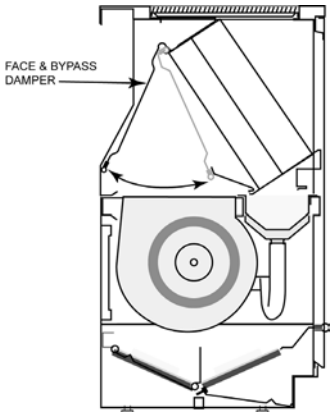


Figure 13. Basic components of active dehumidification control

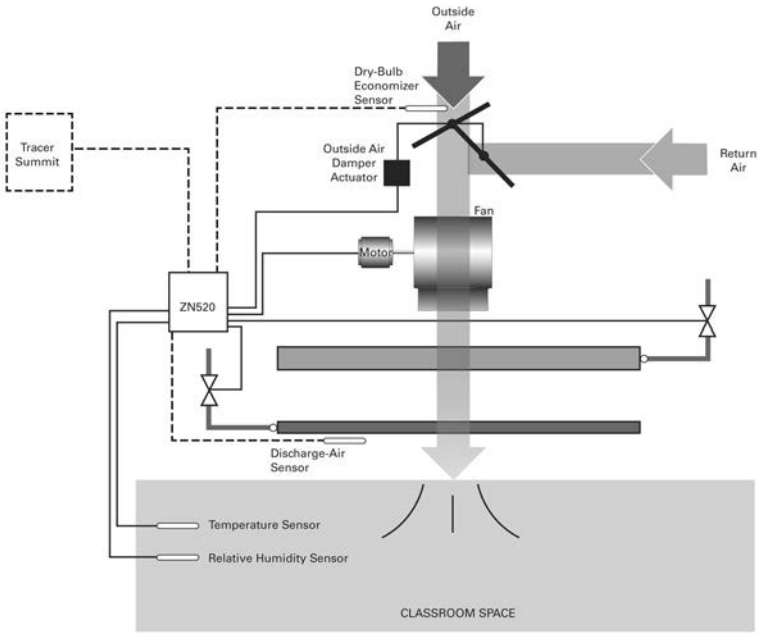
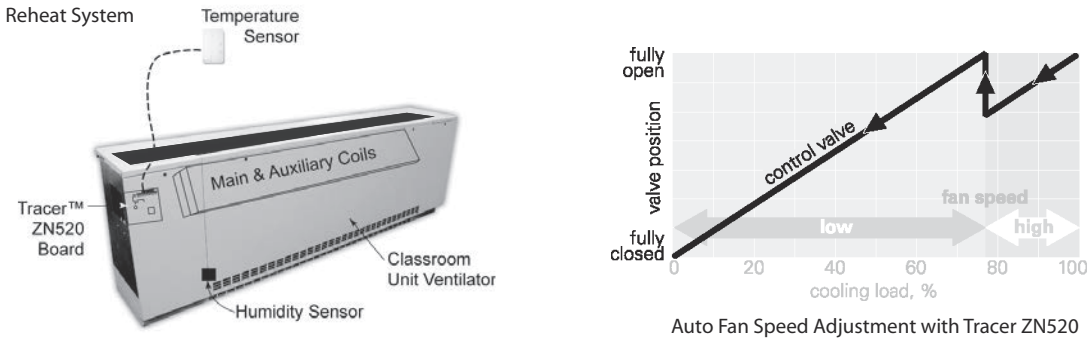


Figure 14. Reheat system and auto fan speed adjustment



Auto Fan Speed Adjustment with Tracer ZN520

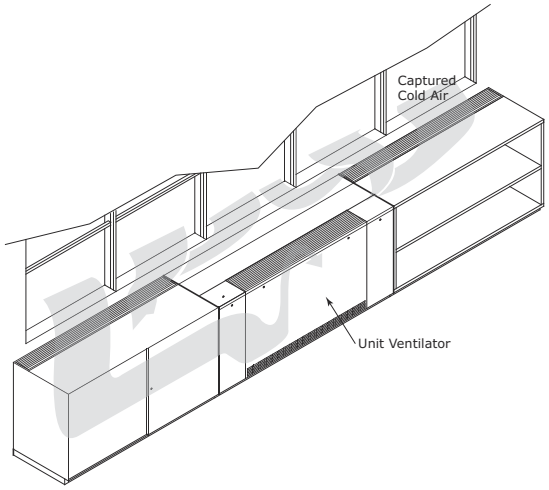
Dynamic Air Barrier

In areas that contend with colder climates for a significant period of time, a school may wish to employ a dynamic air barrier package. With this dynamic (draft) barrier system, the cold air is captured off of the window, and drawn into the classroom unit ventilator's normal airflow cycle. The unit ventilator treats/warms the air as if it were part of a return-air makeup system. This captured air is then discharged into the space providing comfort to the classroom's occupants.

This draft barrier shield should be utilized when:

- Almost 50 percent of the wall includes windows.
- Outside air temperatures fall below 35°F for a significant period of time
- Or, in retrofit applications where the windows are of a single pane thickness.

Figure 15. Dynamic air barrier



Outdoor Air Preconditioning

Conditioning the large amounts of outdoor air required for proper classroom ventilation can significantly increase building cooling and heating loads. It also raises the system's first cost and operating cost. One way to reduce the impact of the outdoor air load on the unit ventilator is to use energy recovered from the exhaust air stream to precondition the outdoor air as it's brought into the building.

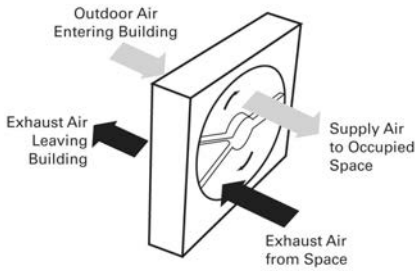
A total-energy recovery (enthalpy) wheel consists of a revolving cylinder filled with a desiccant-coated medium suitable for sensible and latent (moisture) heat transfer, Figure 16, p. 20. The

adjacent outdoor and exhaust air streams pass through the wheel in a counterflow arrangement that transfers energy from one air stream to the other.

During the cooling season, the drier, sensible heat and moisture transfer from the outdoor air to the cooler, drier exhaust air. Conversely, during the heating season, sensible heat and moisture transfers from the exhaust air to preheat and humidify the entering outdoor air stream. Figure 16 psychrometric ally depicts the impact of a preconditioning total-energy wheel on a unit ventilator.

This approach can't directly control humidity in the space, but it can significantly reduce the capacity (and operating cost) of the cooling and heating equipment required to condition the outdoor air. Capable of recovering 65 to 75 percent of the energy in the exhaust air stream, total-energy wheels used in conjunction with unit ventilators can be an attractive alternative when upgrading existing classroom to meet ASHRAE's ventilation requirements; they reduce, perhaps even eliminate, the extra capacity needed at the chiller plant or boiler.

Figure 16. Energy recover wheel

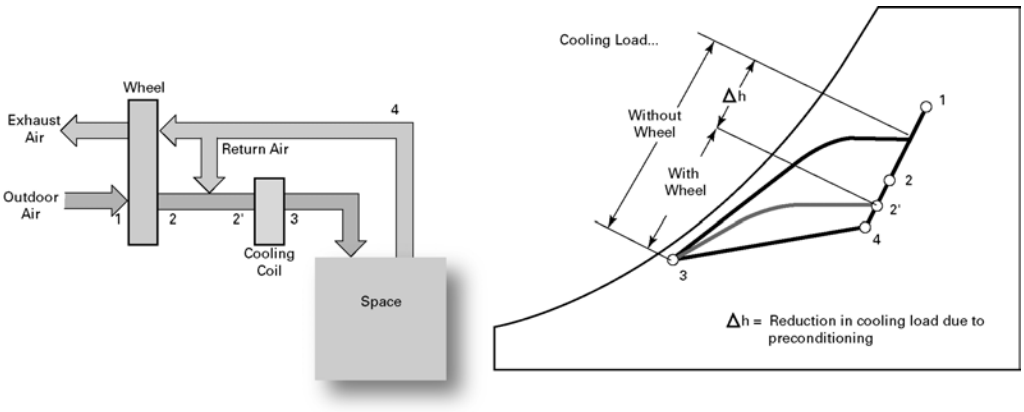


The Trane **ERS energy recovery unit ventilator** is one example of a "cold coil" unit with outdoor air preconditioning.

Note: *Both preconditioning (energy recovery) and post conditioning (reheat) may be applied in the same system.*

For more information on outdoor-air preconditioning and energy recovery, refer to the Trane application engineering manual, *Air-to-Air Energy Recovery in HVAC Systems* (SYS-APM003-EN).

Figure 17. Cold coil with outdoor air preconditioning



Selection Procedure

Trane vertical classroom unit ventilators provide air delivery and capacities necessary to meet the requirements of modern school classrooms. They are available with the industry's widest selection of coils to precisely satisfy heating, ventilating and air conditioning loads with the best individual type of system. Unit ventilator selection involves three basic steps.

- Determine the classroom/space unit cooling and/or heating loads
- Determine the unit size
- Select the coil

Capacity Required

The first step in unit ventilator selection is to determine room heating and air conditioning loads. The calculation of this load is essential if the equipment is to be economical in first cost and operating cost.

Adequate ventilation is mandatory in classroom air conditioning design. The amount is often specified by local or state codes and, in air conditioned schools, may be either the same or less than that specified for heating systems. The usual requirement is between 15 and 25 cfm of outside air per occupant, based on the intended use of the room. For instance, a chemistry laboratory normally requires more ventilation for odor control than a low occupancy speech clinic.

Ventilation is an important concern and should be accurately determined to assure good indoor air quality. Purposely oversizing units should be avoided, since it can cause comfort and control issues.

Unit Size

Unit ventilator size is determined by three factors:

- Total air circulation
- Ventilation cooling economizer capacity required
- Total cooling or heating capacity required

Total air circulation, if not specified by code, should be sufficient to ensure comfort conditions throughout the room. This is usually from six to nine air changes per hour, but can vary with room design and exposure. Often rooms with large sun exposure require additional circulation to avoid hot spots.

Ventilation cooling capacity is determined by the amount of outside air delivered with the outside air damper fully open, and the temperature difference between the outside air and the classroom. In air conditioning applications, ventilation cooling capacities should maintain the comfort setting in the classroom whenever the outside air temperature is below the unit or system changeover temperature.

Example:

Ventilation cooling capacity = 1.085 x cfm_t x (T_1 - T_2)

cfm_t = Total air capacity of unit with outside air damper open 100 percent.

T_1 = Room temperature.

T_2 = Outside air temperature.

In classrooms with exceptionally heavy air conditioning loads, unit size may be determined by the total cooling requirement. Good practice dictates 375 to 425 cfm per ton of hydronic cooling capacity. Normally, however, Trane classroom air conditioner coils have sufficient capacities.

Example:

Given: Air circulation specified = 8 air changes per hour.

Classroom size = 35 ft long x 25 ft wide x 10 ft high

Inside design air temperature = 75 degrees F

Ventilation cooling required at 58 degrees F = 29,000 BTU

$$\text{CFM required} = \frac{8 \text{ changes/hr} \times (35 \times 25 \times 10)\text{ft}^3}{60 \text{ Minutes/hr}} = 1170 \text{ cfm}$$

Checking ventilation cooling capacity:

29,800 BTU = 1.085 x CFM x (80-58)

CFM = 1250

This indicates that a 1250 cfm unit would have satisfactory ventilation cooling capacity at the design changeover point of 58°F. Coil capacity will become confirmed when the coil is selected.

Coil Selection

Selecting the correct coil is done through Trane's Official Product Selection System (TOPSS) For your convenience, TOPSS has a mixed air calculator built into the program.

Model Number Descriptions

Vertical Unit Ventilator Model Number

Digits 1, 2, 3 — Unit Configuration

VUV= Vertical Unit Ventilator

Digit 4 — Development Sequence

E

Digits 5, 6, 7 — Nominal Airflow

075 = 750 cfm
100 = 1000 cfm
125 = 1250 cfm
150 = 1500 cfm

Digit 8 — Voltage (Volts/Hz/Phase)

0 = 115/60/1
1 = 208/60/1
2 = 230/60/1
3 = 208/60/3
4 = 460/60/3
7 = 277/60/1
8 = 230/60/3

Digit 9 — Open Digit

Digits 10, 11 — Current Design Sequence

Digit 12 — Face & Bypass

Y = Yes, Include Damper
N = No Damper

Digit 13 — Unit Arrangement

1 = Return Air Front / Fresh Air Back
2 = 100% Return Air Front
3 = 100% Fresh Air Back
4 = Dynamic Air Barrier
5 = ERS-Compatible w/RH Connection
6 = ERS-Compatible w/LH Connection

Digit 14 — Preheat / Reheat / Changeover

A = 4-Pipe Preheat (RH Clg/LH Htg)
B = 4-Pipe Preheat (LH Clg/RH Htg)
C = 4-Pipe Reheat (RH Clg/LH Htg)
D = 4-Pipe Reheat (LH Clg/RH Htg)
E = 2-Pipe (RH Connections)
F = 2-Pipe (LH Connections)

Digit 15 — Cooling / 2-Pipe Coil

0 = None
B = 2-Row, 12 F.P.I.
C = 2-Row, 16 F.P.I.
D = 3-Row, 12 F.P.I.
E = 3-Row, 16 F.P.I.
F = 4-Row, 12 F.P.I.
G = 4-Row, 14 F.P.I.
H = 3-Row, 16 F.P.I, EarthWise™ Coil
J = 3-Row, DX (R-410A) Cooling Coil

Digit 16 — Heating Coil

0 = None
A = 1-Row, 12 F.P.I.
B = 2-Row, 12 F.P.I.
C = 2-Row, 16 F.P.I.
D = 3-Row, 12 F.P.I.
E = 3-Row, 16 F.P.I.
F = 4-Row, 12 F.P.I.
G = 4-Row, 14 F.P.I.
H = 3-Row, 16 F.P.I, EarthWise Coil
K = Steam Low
L = Steam High
M = Electric Heat - Low
N = Electric Heat - Med
P = Electric Heat - High

Digit 17 — Motor

0 = Electronically Commutated Motor (ECM)
1 = ECM & Low Acoustic Option
2 = ECM & Low FLA Option
3 = ECM & Low Acoustic & Low FLA Option

Digit 18 — Other Motor Items

A = None
B = Toggle
C = Circuit Breaker

Digit 19 — 2- or 3-Way Valve - Cooling Changeover Coil

0 = None
2 = 2-Way; 3-Point Floating
3 = 3-Way; 3-Point Floating
4 = 2-Way; 2–10 Volt
5 = 3-Way; 2–10 Volt
6 = Isolation Valve; 2-Way
7 = Isolation Valve; 3-Way

Digit 20 — CV - Cooling or Changeover Coil

0 = None
L = Low Cv
M = Medium Cv
H = High Cv

Digit 21 — 2- or 3-Way Valve - Preheat or Reheat Heating Coil

0 = None
2 = 2-Way; 3-Point Floating
3 = 3-Way; 3-Point Floating
4 = 2-Way; 2–10 Volt
5 = 3-Way; 2–10 Volt
6 = Isolation Valve; 2-Way
7 = Isolation Valve; 3-Way

Digit 22 — CV - Preheat or Reheat Heating Coil

0 = None
L = Low Cv
M = Medium Cv
H = High Cv

Digit 23 — Discharge Arrangement

0 = Opening Only, No Grille
A = Discharge Grille
B = Double Deflection Discharge Grille
C = Grille Discharge with Wire Mesh

Digit 24 — Outside Air Damper Control

0 = None
A = 3-Wire Actuator
B = 2–10 Volt Actuator

Digit 25 — Face and Bypass Damper Control

0 = None
A = 3-Wire Actuator
B = 2–10 Volt Actuator

Digit 26 — Controls

0 = None, Unit-Mounted Speed Switch
2 = Customer Supplied Terminal Interface (CSTI)
3 = CSTI w/Low Temp Detection
4 = Tracer ZN520
5 = Tracer ZN520 w/Time Clock
6 = Tracer ZN520 with w/Fan Status
7 = Tracer UC400
8 = Tracer UC400 w/Time Clock

Digit 27 — Unit- or Wall-Mounted Controls

0 = None
1 = Unit-Mounted
2 = Wall-Mounted
3 = Unit-Mounted Fan Speed Switch & Wall-Mounted Temperature Sensor
4 = Wireless Zone Sensor

Note: *The wall-mounted room sensor is ordered as separate line item.*

Digit 28 — Internal or External Set Point

0 = None
2 = External
3 = Digital Display

Digit 29 — Timed Override

0 = No
1 = Yes

Digit 30 — Exhaust Control

A = No Exhaust Control with 3-Speed Supply Fan
B = Exhaust Control with 2-Speed Supply Fan

Digit 31 — Control Programming (Sensor Included)

0 = None
1 = Humidity Sensor Programming
2 = CO_2 Sensor Programming

Digit 32 — Unit Depth

A = Standard (16-5/8 in.)
B = 21-1/4 in. Depth with Baffle
C = 21-1/4 in. Depth with Full Sheet Metal Back and Baffle
D = 21-1/4 in. Depth with 25 in. High Falseback
E = 21-1/4 in. Depth with 26 in. High Falseback
F = 21-1/4 in. Depth with 27 in. High Falseback
G = 21-1/4 in. Depth with 28 in. High Falseback
H = 21-1/4 in. Depth with 29 in. High Falseback
J = 21-1/4 in. Depth without Baffle

Note: *Selection "J" should be applied if OA opening is raised above standard baffle location.*

Digit 33 — End Covers

0 = None
1 = 16-5/8 in. Depth without Cutouts
2 = 16-5/8 in. Depth with 3 x 7-1/4 in. Cutout
4 = 21-1/4 in. Depth without Cutouts
5 = 21-1/4 in. Depth with 3 x 7-1/4 in. Cutout
6 = 21-1/4 in. Depth with 3-1/4 in. x 16-7/8 in. Cutout

Digit 34 — Front Panel

1 = Standard Front Panel
2 = Heavy Gauge Front Panel

Digit 35 — Subbase

0 = No Subbase
2 = 2 in. Subbase
4 = 4 in. Subbase
6 = 6 in. Subbase

Digit 36 — Piping Package

0 = None
1 = Ball Valves & P/T Ports
2 = Ball Valve & Circuit-Setter with P/T Ports
3 = Ball Valve, Circuit-Setter with P/T Ports & Strainer

Digit 37 — Flow Control - Cooling/Changeover Coil

0 = None

Digit 38 — Flow Controls - Heating Coil

0 = None

Digit 39 — Auxiliary Drain Pan - Piping

Y = Yes, Auxiliary Drain Pan
N = No Auxiliary Drain Pan

Digit 40 — Crossover Piping

0 = None
1 = Internal
2 = External 1-3/8 in. Crossover Piping
3 = External 2-1/8 in. Crossover Piping

Digit 41 — Filter

1 = Standard Throwaway Filter
2 = MERV 8 Filter
3 = MERV 13 Filter

Digit 42 — Color

1 = Deluxe Beige
2 = Cameo White
3 = Soft Dove
4 = Stone Gray
5 = Driftwood Gray

General Data

Table 1. General data

Description	Unit size			
	0750	**1000**	**1250**	**1500**
Unit length without end covers (in.)	69	81	93	105
Unit depth—standard (in.)	16-5/8	16-5/8	16-5/8	16-5/8
Unit depth—with false back (in.)	21-1/4	21-1/4	21-1/4	21-1/4
Unit height—standard (in.)	30	30	30	30
Shipping weight (lb)	320	405	450	470
Nominal filter size (in.) and quantity	14 x 20 x 1 (2)	14 x 24 x 1 (1) 14 x 30 x 1 (1)	14 x 20 x 1 (2) 14 x 24 x 1 (1)	14 x 24 x 1 (2) 14 x 30 x 1 (1)
Dynamic air filter nominal size (in.) and quantity	7 x 42 x 1 (1)	7 x 54 x 1 (1)	7 x 66 x 1 (1)	7 x 78 x 1 (1)
Drain connection size (in.)	7/8 ID Hose	7/8 ID Hose	7/8 ID Hose	7/8 ID Hose
Fan type / quantity	FC / 2	FC / 2	FC / 4	FC / 4
Motor data				
Quantity	1	1	2	2
Horsepower (ea.)	1/4	1/4	1/4	1/4
Coil volume (gal) by coil type				
A	0.178	0.228	0.277	0.327
B	0.311	0.410	0.510	0.610
C	0.311	0.410	0.510	0.610
D	0.444	0.571	0.704	0.931
E	0.444	0.571	0.704	0.931
F	0.610	0.809	1.014	1.213
G	0.610	0.809	1.014	1.213
H	0.395	0.593	0.742	0.837

Table 2. Control methodology

	Fan Speed
FSS	3 or infinite[a]
CSTI	3 or infinite[a]
Tracer ZN520	3
Tracer UC400	Infinite

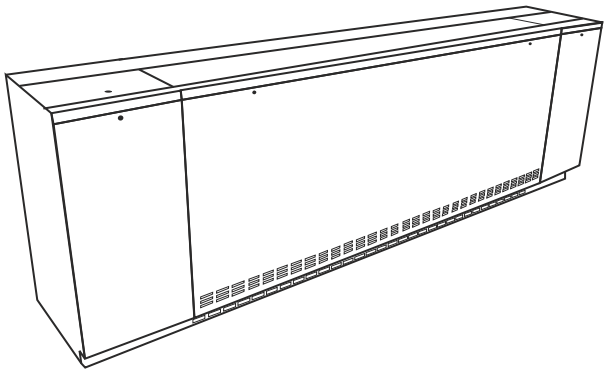
(a) With a field-supplied 2–10 Vdc controller.

Table 3. Control sequences

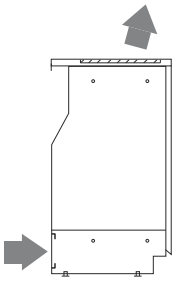
	Fan Speeds
DX operation[a]	1
Electric heat operation[a]	1
Sidewall Exhaust[b]	2
ERSA[b]	2

(a) Fan speed during sequence operation.
(b) Unit Ventilator when operating with option.

Figure 18. Discharge and inlet arrangements



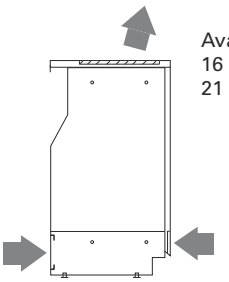
Discharge Arrangement



Available in:
16 5/8" Depth
21 1/4" Depth

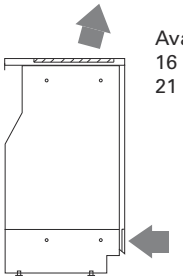
Digit 23 = 0, A, B, C
0 = Opening Only
A = Grille Discharge
B = Double Deflection Discharge Grille
C = Discharge Grille with Wire Mesh

Inlet Arrangement



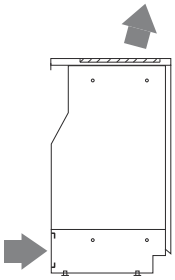
Available in:
16 5/8" Depth
21 1/4" Depth

Digit 13 = 1
RA Front with FA Back



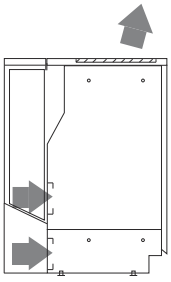
Available in:
16 5/8" Depth
21 1/4" Depth

Digit 13 = 2
100% Return Air Front



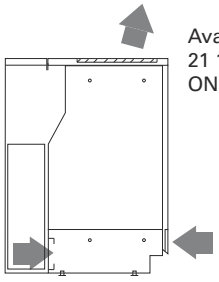
Available in:
16 5/8" Depth
21 1/4" Depth

Digit 13 = 3
100% Fresh Air Back



Available in:
21 1/4" Depth
ONLY

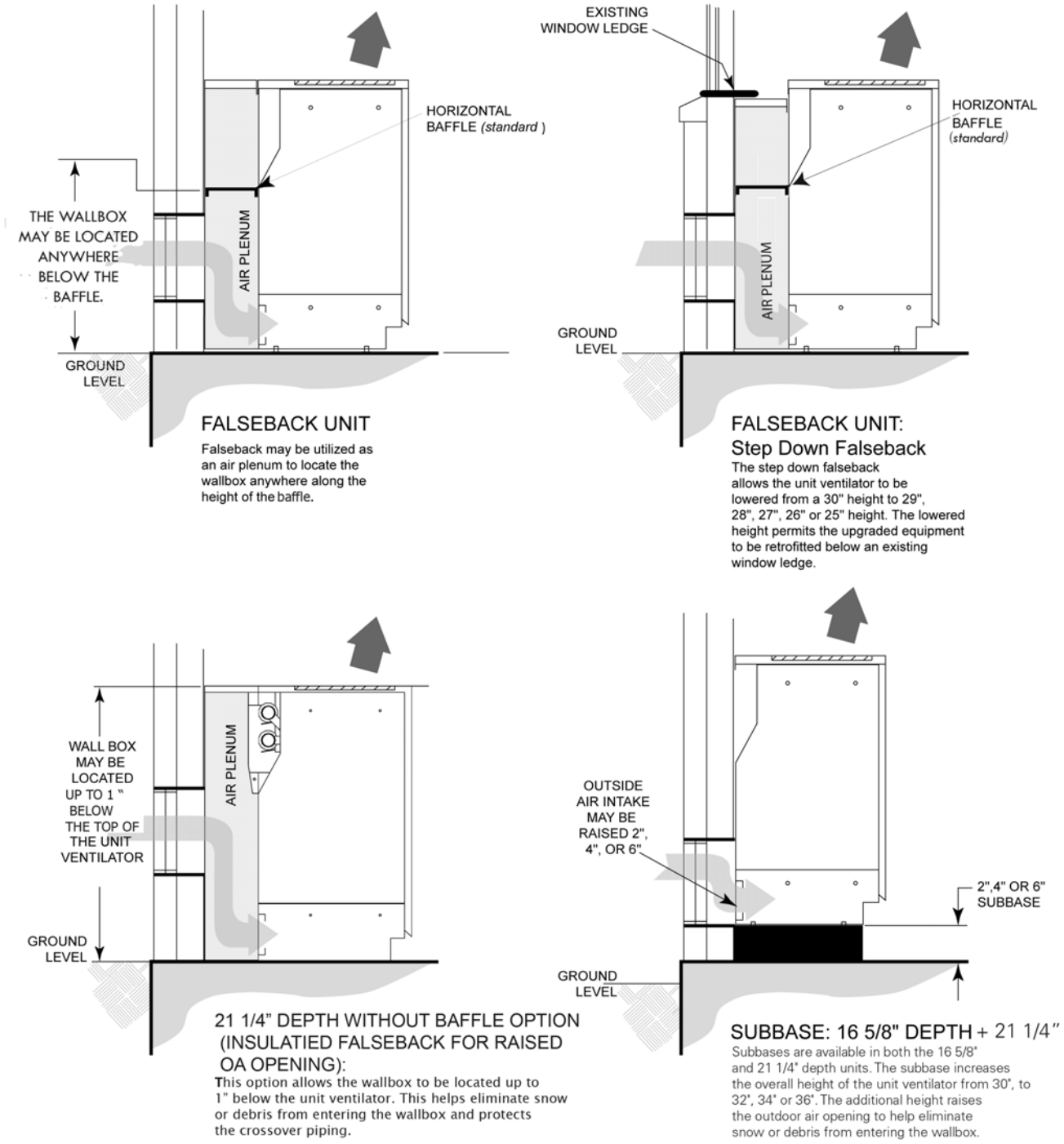
Digit 13 = 4
Dynamic Air Barrier



Available in:
21 1/4" Depth
ONLY

Digit 13 = 5, 6
(5) RH Energy Recovery System
ERS Compatible
(6) LH Energy Recovery System
ERS Compatible

Figure 19. Falseback and subbase


HORIZONTAL BAFFLE (standard)
THE WALLBOX MAY BE LOCATED ANYWHERE BELOW THE BAFFLE.
AIR PLENUM
GROUND LEVEL
FALSEBACK UNIT
Falseback may be utilized as an air plenum to locate the wallbox anywhere along the height of the baffle.
EXISTING WINDOW LEDGE
HORIZONTAL BAFFLE (standard)
AIR PLENUM
GROUND LEVEL
FALSEBACK UNIT: Step Down Falseback
The step down falseback allows the unit ventilator to be lowered from a 30" height to 29", 28", 27", 26" or 25" height. The lowered height permits the upgraded equipment to be retrofitted below an existing window ledge.
WALL BOX MAY BE LOCATED UP TO 1 " BELOW THE TOP OF THE UNIT VENTILATOR
AIR PLENUM
GROUND LEVEL
21 1/4" DEPTH WITHOUT BAFFLE OPTION (INSULATIED FALSEBACK FOR RAISED OA OPENING):
This option allows the wallbox to be located up to 1" below the unit ventilator. This helps eliminate snow or debris from entering the wallbox and protects the crossover piping.
OUTSIDE AIR INTAKE MAY BE RAISED 2", 4", OR 6"
2",4" OR 6" SUBBASE
GROUND LEVEL
SUBBASE: 16 5/8" DEPTH + 21 1/4"
Subbases are available in both the 16 5/8" and 21 1/4" depth units. The subbase increases the overall height of the unit ventilator from 30", to 32", 34" or 36". The additional height raises the outdoor air opening to help eliminate snow or debris from entering the wallbox.

Performance Data

Table 4. Coil combination selection chart (cooling, 2-pipe changeover or heating-only coils)

Coil type	Coil description		Preheat or reheat coils							
			A	B	C	K	L	M	N	P
A	1-row, 12 fpi		Heating only							
B	2-row, 12 fpi	*B and C cooling data available in TOPSS*	x	x	x	x	x	x	x	x
C	2-row, 16 fpi		x	x	x	x	x	x	x	x
D	3-row, 12 fpi		x	x	x			x	x	x
E	3-row, 16 fpi		x	x	x			x	x	x
F	4-row, 12 fpi		x							
G	4-row, 16 fpi		x							
H	3-row, 16 fpi (EarthWise)		x	x	x					
J	3-row, DX (R-410A)		x	x	x	x	x	x	x	x
K	Steam, low capacity		Heating only							
L	Steam, high capacity									
M	Electric heat – 3-element		Heating only							
N	Electric heat – 4-element									
P	Electric heat – 6-element									

Notes:
1. All coil types on the left side of the grid are available in single-coil, heating only, or 2-pipe changeover with exception of coil type A.
2. For 2-coil or 4-pipe systems, select the cooling coil on the left side of the grid. An **X** corresponds to a valid heating coil combination.
3. Shaded areas signify valid selections with face and bypass dampers.

Example 1:

4-pipe, chilled water / hot water

Type E, 3-row (16 fpi) cooling coil, may be selected with
Type B, 2-Row (12 fpi) preheat or reheat coil

Example 2:

4-pipe, DX cooling / steam heating

Type J, 3-row DX cooling coil, may be selected with
Type L, high-capacity steam heating coil

Notes:

- *Supply and return coil connections are on the same side.*
- *In 4-pipe systems, the cooling coil connections are on the opposite end from the heating coil connections.*
- *DX coils are always left-hand connections.*
- *Electric heat coils are always right-hand connections.*
- *Heating coils (hot water or steam) are right-hand when in the reheat position with DX cooling coils.*

Table 5. Airflow through coil combination

	Unit size			
Coil combination	**0750**	**1000**	**1250**	**1500**
A	833	1072	1406	1669
B	788	1032	1293	1578
C	759	1011	1315	1515
D	748	989	1253	1495
E	717	934	1243	1437
F	684	1005	1233	1437
G	627	983	1215	1524
H	717	934	1243	1437
J	748	989	1253	1495
K	825	1052	1377	1623
L	816	1042	1350	1600
B & A	738	1057	1178	1638
B & B	684	1016	1301	1564
B & C	650	994	1320	1504
B & D	639	971	1263	1484
B & E	808	911	1253	1421
B & H	808	911	1253	1421
B & J	669	971	1263	1484
C & A	706	1037	1196	1583
C & C	818	971	1339	1442
C & D	808	947	1282	1421
C & E	779	885	1272	1356
C & H	779	885	1272	1356
C & J	808	947	1282	1421
D & A	695	1016	1143	1564
E & A	662	959	1134	1504
F & A	627	947	1126	1504
G & A	779	923	1320	1421
H & A	662	959	1134	1504
J & A	707	1016	1357	1564
B & K	728	1037	1157	1602
C & K	695	1016	1174	1544
D & K	684	994	1122	1524
E & K	650	935	1114	1463
H & K	650	935	1114	1463
J & K	699	994	1335	1524
B & L	717	1027	1136	1583
C & L	684	1005	1153	1524
D & L	673	983	1102	1504
E & L	639	923	1094	1442
H & L	639	923	1094	1442
J & L	692	983	1102	1504
B & M	767	1093	1182	1362
C & M	744	1075	1195	1324
D & M	736	1057	1156	1311
E & M	714	1005	1149	1266
H & M	714	1005	1149	1266
J & M	736	1057	1156	1475
B & N	759	1084	1169	1350
C & N	736	1066	1182	1311
D & N	729	1047	1142	1296
E & N	707	994	1135	1251
H & N	707	994	1135	1251
J & N	729	1047	1142	1456
B & P	751	1075	1156	1338
C & P	729	1057	1169	1296
D & P	721	1037	1128	1282
E & P	699	983	1121	1544
H & P	699	983	1121	1544
J & P	721	1037	1128	1437

Table 6. Hydronic coil performance summary

Size	Coil	Rows	CFM	Cooling Performance 80/67°F EAT, 45–55°F				Heating Performance 60°F EAT, 160°F EWT		
				GPM	QT	QS	DP	GPM	QT	DP
0750	A	1	833	Not available				4.0	36.9	5.4
	B	2	788	3.2	15.4	12.7	1.6	3.0	51.6	1.4
	C	2	759	3.6	17.3	13.7	1.9	3.3	55.6	1.6
	D	3	748	4.8	23.4	16.2	3.4	3.5	57.4	1.9
	E	3	717	5.2	25.2	16.7	3.9	3.4	57.2	1.8
	F	4	684	4.7	22.8	15.1	2.2	3.5	53.5	1.4
	G	4	627	4.8	23.2	15.0	2.3	3.8	53.5	1.6
	H	3	717	5.7	27.9	17.3	10.3	3.4	61.5	4.1
1000	A	1	1071	Not available				4.0	45.6	6.4
	B	2	1035	5.1	24.7	20.1	3.7	4.2	70.8	2.5
	C	2	1013	5.8	28.0	21.7	4.8	4.5	76.0	2.9
	D	3	990	5.9	28.7	20.7	2.9	4.7	74.6	1.9
	E	3	933	6.3	30.7	20.7	3.3	4.6	73.9	1.8
	F	4	1007	7.8	38.2	25.8	6.7	4.7	76.2	2.5
	G	4	984	8.3	40.7	26.7	7.5	5.1	79.4	2.9
	H	3	933	7.4	36.0	24.2	8.8	4.7	79.7	4.0
1250	A	1	1406	Not available				6.0	63.2	15.5
	B	2	1293	6.5	31.5	24.6	6.0	5.5	81.0	4.4
	C	2	1315	7.3	35.4	26.5	7.4	5.8	90.3	4.9
	D	3	1253	8.0	38.9	27.3	6.2	6.0	95.1	3.8
	E	3	1243	8.4	41.1	27.5	6.7	5.8	94.8	3.6
	F	4	1233	7.7	37.4	27.0	4.0	5.8	92.0	2.3
	G	4	1215	8.3	40.3	28.1	4.6	6.4	95.6	2.8
	H	3	1243	9.0	43.8	29.2	15.0	5.8	101.8	7.0
1500	A	1	1669	Not available				6.0	77.7	17.4
	B	2	1578	8.3	40.5	27.6	11.2	6.4	103.9	6.9
	C	2	1515	9.1	44.2	29.0	13.3	7.1	110.3	8.4
	D	3	1495	10.4	50.8	34.4	9.1	7.1	117.4	4.6
	E	3	1437	10.9	53.4	35.0	10.0	7.0	117.2	4.5
	F	4	1437	11.9	58.3	36.6	8.8	7.2	118.5	3.6
	G	4	1524	12.6	61.6	38.1	9.8	7.7	126.9	4.1
	H	3	1437	12.2	59.7	35.8	14.5	7.2	125.1	5.7

EAT = entering air temperature (°F)
EWT = entering water temperature (°F)
CFM = tate of airflow (ft^3/min)
GPM = water flow (gal/min)
QT = total capacity (MBh)
QS = sensible cooling capacity (MBh)
DP = waterside pressure drop (ft H_2O)

Table 7. VUV 075, cooling coil cell D, 3-row / 12 fpi

Entering Wet Bulb Temp (°F)	Entering Dry Bulb Temp (°F)	Entering Water Temp (°F)	Flow Rate (gpm) 2 Total Capacity (MBh)	2 Sensible Capacity (MBh)	2 ΔT (°F)	4 Total Capacity (MBh)	4 Sensible Capacity (MBh)	4 ΔT (°F)	6 Total Capacity (MBh)	6 Sensible Capacity (MBh)	6 ΔT (°F)	10 Total Capacity (MBh)	10 Sensible Capacity (MBh)	10 ΔT (°F)
61	70	40	11.6	9.5	12.3	17.3	12.0	9.0	21.3	13.5	7.3	25.7	15.2	5.3
		42	11.0	9.2	11.7	16.4	11.7	8.5	20.1	13.0	6.9	24.0	14.5	4.9
		45	10.1	8.7	10.8	14.9	11.1	7.8	18.2	12.3	6.3	21.5	13.6	4.4
		48	9.2	8.2	9.8	13.4	10.4	7.0	16.2	11.6	5.6	18.9	12.7	3.9
	75	40	12.7	12.3	13.4	18.9	15.6	9.8	23.3	17.5	8.0	28.0	19.7	5.7
		42	12.0	11.9	12.7	17.8	15.1	9.3	21.9	16.9	7.5	26.2	18.8	5.4
		45	11.0	11.0	11.7	16.2	14.3	8.5	19.8	15.9	6.8	23.4	17.6	4.8
		48	10.0	10.0	10.7	14.6	13.5	7.7	17.7	15.0	6.1	20.6	16.4	4.3
	80	40	14.1	14.1	14.8	21.0	18.9	10.8	25.8	21.2	8.8	31.1	23.8	6.4
		42	13.3	13.3	14.0	19.8	18.3	10.2	24.3	20.4	8.3	29.1	22.8	5.9
		45	12.2	12.2	12.9	18.0	17.3	9.3	22.0	19.3	7.5	26.0	21.3	5.3
		48	11.1	11.1	11.8	16.2	16.2	8.5	19.6	18.2	6.8	22.8	19.8	4.7
	85	40	15.7	15.7	16.4	23.4	22.0	12.0	28.8	24.7	9.8	34.7	27.7	7.1
		42	14.9	14.9	15.6	22.1	21.3	11.4	27.1	23.8	9.3	32.4	26.5	6.6
		45	13.6	13.6	14.3	20.1	20.1	10.4	24.5	22.5	8.4	29.0	24.8	5.9
		48	12.4	12.4	13.1	18.1	18.1	9.4	21.9	21.1	7.5	25.5	23.1	5.2
	90	40	17.5	17.5	18.2	26.1	24.9	13.4	32.1	28.0	10.9	38.7	31.4	7.9
		42	16.6	16.6	17.3	24.6	24.1	12.7	30.2	26.9	10.3	36.1	30.1	7.4
		45	15.2	15.2	15.9	22.4	22.4	11.5	27.3	25.4	9.3	32.3	28.1	6.6
		48	13.8	13.8	14.5	20.2	20.2	10.4	24.4	23.9	8.4	28.4	26.2	5.8
67	75	40	15.9	10.2	16.6	23.7	13.0	12.2	29.1	14.5	9.9	35.1	16.3	7.1
		42	15.0	9.9	15.7	22.3	12.5	11.5	27.4	14.0	9.4	32.8	15.6	6.7
		45	13.8	9.4	14.5	20.3	11.9	10.5	24.8	13.2	8.5	29.3	14.6	6.0
		48	12.5	8.8	13.2	18.3	11.2	9.5	22.1	12.5	7.6	25.8	13.6	5.3
	80	40	16.7	13.2	17.4	24.8	16.8	12.8	30.6	18.8	10.4	36.8	21.2	7.5
		42	15.8	12.8	16.5	23.4	16.2	12.1	28.7	18.2	9.8	34.4	20.3	7.0
		45	14.4	12.1	15.1	21.3	15.4	11.0	26.0	17.1	8.9	30.7	18.9	6.3
		48	13.1	11.4	13.8	19.2	14.5	9.9	23.2	16.1	8.0	27.0	17.6	5.5
	85	40	17.7	16.1	18.4	26.4	20.5	13.6	32.5	23.0	11.1	39.2	25.8	8.0
		42	16.8	15.6	17.5	24.9	19.8	12.8	30.6	22.2	10.4	36.6	24.7	7.5
		45	15.4	14.8	16.1	22.7	18.8	11.7	27.7	20.9	9.4	32.7	23.1	6.7
		48	14.0	13.9	14.7	20.4	17.8	10.6	24.7	19.7	8.5	28.8	21.5	5.9
	90	40	19.0	18.9	19.7	28.3	24.1	14.5	34.9	27.0	11.9	42.0	30.4	8.5
		42	18.0	18.0	18.7	26.8	23.3	13.7	32.8	26.0	11.2	39.3	29.1	8.0
		45	16.5	16.5	17.2	24.3	22.1	12.5	29.7	24.6	10.1	35.1	27.1	7.2
		48	15.0	15.0	15.7	21.9	20.9	11.3	26.5	23.1	9.1	30.9	25.3	6.3
70	75	40	18.1	8.9	18.8	26.9	11.3	13.8	33.1	12.7	11.3	39.9	14.3	8.1
		42	17.1	8.6	17.8	25.4	11.0	13.0	31.2	12.3	10.6	37.3	13.7	7.6
		45	15.7	8.2	16.4	23.1	10.4	11.9	28.2	11.6	9.6	33.3	12.8	6.8
		48	14.2	7.7	14.9	20.8	9.8	10.8	25.2	10.9	8.6	29.3	11.9	6.0
	80	40	18.6	12.0	19.3	27.7	15.2	14.2	34.0	17.1	11.6	41.0	19.2	8.3
		42	17.6	11.6	18.3	26.1	14.7	13.4	32.0	16.5	10.9	38.3	18.4	7.8
		45	16.1	11.0	16.8	23.8	14.0	12.2	29.0	15.6	9.9	34.2	17.2	7.0
		48	14.6	10.4	15.3	21.4	13.2	11.0	25.9	14.6	8.8	30.1	16.0	6.2
	85	40	19.4	15.0	20.1	28.9	19.1	14.8	35.5	21.4	12.1	42.8	24.1	8.7
		42	18.4	14.5	19.0	27.2	18.5	14.0	33.4	20.7	11.4	40.0	23.0	8.1
		45	16.8	13.8	17.5	24.8	17.5	12.7	30.2	19.5	10.3	35.7	21.5	7.3
		48	15.3	13.0	15.9	22.3	16.5	11.5	27.0	18.3	9.2	31.4	20.0	6.4
	90	40	20.4	18.0	21.1	30.4	22.9	15.6	37.5	25.7	12.7	45.1	28.8	9.2
		42	19.3	17.4	20.0	28.7	22.1	14.7	35.2	24.7	12.0	42.2	27.6	8.6
		45	17.7	16.5	18.4	26.1	21.0	13.4	31.9	23.4	10.8	37.7	25.8	7.7
		48	16.1	15.5	16.8	23.5	19.8	12.1	28.4	22.0	9.7	33.1	24.0	6.8

Table 8. VUV 075, cooling coil E, 3-row / 16 fpi

Entering Wet Bulb Temp (°F)	Entering Dry Bulb Temp (°F)	Entering Water Temp (°F)	Flow Rate (gpm) 2 Total Capacity (MBh)	2 Sensible Capacity (MBh)	2 ΔT (°F)	4 Total Capacity (MBh)	4 Sensible Capacity (MBh)	4 ΔT (°F)	6 Total Capacity (MBh)	6 Sensible Capacity (MBh)	6 ΔT (°F)	10 Total Capacity (MBh)	10 Sensible Capacity (MBh)	10 ΔT (°F)
61	70	40	12.0	9.5	12.6	17.9	12.1	9.3	22.0	13.6	7.6	26.4	15.3	5.4
		42	11.3	9.2	12.0	16.9	11.7	8.8	20.8	13.1	7.1	24.8	14.7	5.1
		45	10.4	8.8	11.1	15.4	11.1	8.0	18.8	12.4	6.5	22.2	13.7	4.6
		48	9.4	8.3	10.1	13.9	10.5	7.3	16.8	11.6	5.8	19.5	12.7	4.0
	75	40	13.0	12.4	13.7	19.5	15.7	10.1	24.0	17.7	8.2	28.8	19.9	5.9
		42	12.3	12.0	13.0	18.4	15.2	9.6	22.6	17.0	7.8	27.0	19.0	5.5
		45	11.3	11.3	12.0	16.8	14.4	8.7	20.5	16.0	7.1	24.2	17.7	5.0
		48	10.3	10.3	11.0	15.1	13.6	7.9	18.3	15.1	6.3	21.3	16.5	4.4
	80	40	14.5	14.5	15.1	21.6	19.0	11.2	26.7	21.4	9.1	32.0	24.1	6.5
		42	13.7	13.7	14.4	20.4	18.4	10.6	25.1	20.6	8.6	29.9	23.0	6.1
		45	12.5	12.5	13.2	18.6	17.5	9.7	22.7	19.4	7.8	26.8	21.5	5.5
		48	11.4	11.4	12.1	16.8	16.5	8.7	20.3	18.3	7.0	23.6	19.9	4.9
	85	40	16.1	16.1	16.8	24.2	22.1	12.4	29.8	24.9	10.1	35.7	28.0	7.3
		42	15.3	15.3	16.0	22.8	21.4	11.8	28.0	24.0	9.6	33.4	26.8	6.8
		45	14.0	14.0	14.7	20.8	20.3	10.7	25.4	22.6	8.7	29.9	25.0	6.1
		48	12.7	12.7	13.4	18.7	18.7	9.7	22.7	21.2	7.8	26.3	23.2	5.4
	90	40	18.0	18.0	18.7	26.9	25.1	13.8	33.2	28.2	11.3	39.8	31.7	8.1
		42	17.0	17.0	17.7	25.4	24.3	13.1	31.2	27.1	10.6	37.2	30.3	7.6
		45	15.6	15.6	16.3	23.2	23.0	11.9	28.3	25.6	9.7	33.3	28.3	6.8
		48	14.2	14.2	14.9	20.9	20.9	10.8	25.3	24.1	8.7	29.4	26.3	6.0
67	75	40	16.3	10.3	17.0	24.4	13.1	12.5	30.1	14.7	10.3	36.1	16.5	7.4
		42	15.4	9.9	16.1	23.1	12.6	11.9	28.3	14.1	9.7	33.8	15.8	6.9
		45	14.2	9.4	14.8	21.0	12.0	10.8	25.6	13.3	8.8	30.2	14.7	6.2
		48	12.9	8.9	13.5	18.9	11.3	9.8	22.9	12.5	7.9	26.6	13.7	5.5
	80	40	17.1	13.3	17.8	25.6	16.9	13.2	31.6	19.0	10.7	37.9	21.4	7.7
		42	16.2	12.9	16.9	24.2	16.3	12.4	29.7	18.3	10.1	35.4	20.4	7.2
		45	14.8	12.2	15.5	22.0	15.5	11.4	26.9	17.2	9.2	31.7	19.1	6.5
		48	13.5	11.5	14.2	19.9	14.6	10.3	24.1	16.2	8.2	27.9	17.7	5.7
	85	40	18.2	16.2	18.9	27.3	20.6	14.0	33.6	23.2	11.4	40.3	26.1	8.2
		42	17.3	15.7	17.9	25.8	19.9	13.2	31.6	22.3	10.8	37.7	24.9	7.7
		45	15.8	14.9	16.5	23.5	18.9	12.1	28.6	21.1	9.8	33.8	23.3	6.9
		48	14.4	14.1	15.0	21.2	17.9	10.9	25.6	19.8	8.8	29.7	21.6	6.1
	90	40	19.5	19.1	20.2	29.3	24.2	15.0	36.0	27.2	12.2	43.2	30.6	8.8
		42	18.5	18.5	19.2	27.6	23.4	14.2	33.9	26.2	11.5	40.5	29.3	8.2
		45	17.0	17.0	17.6	25.2	22.2	12.9	30.7	24.7	10.5	36.2	27.3	7.4
		48	15.4	15.4	16.1	22.7	21.0	11.7	27.5	23.3	9.4	31.9	25.4	6.5
70	75	40	18.6	9.0	19.2	27.8	11.4	14.2	34.2	12.8	11.6	41.1	14.4	8.4
		42	17.6	8.7	18.3	26.3	11.0	13.5	32.2	12.4	11.0	38.4	13.8	7.8
		45	16.1	8.3	16.8	23.9	10.5	12.3	29.2	11.7	10.0	34.4	12.9	7.0
		48	14.6	7.8	15.3	21.6	9.9	11.1	26.1	11.0	8.9	30.3	12.0	6.2
	80	40	19.1	12.1	19.8	28.5	15.3	14.6	35.2	17.2	11.9	42.2	19.4	8.6
		42	18.1	11.7	18.7	27.0	14.8	13.8	33.1	16.6	11.3	39.5	18.6	8.0
		45	16.5	11.1	17.2	24.6	14.1	12.6	30.0	15.7	10.2	35.3	17.3	7.2
		48	15.0	10.5	15.7	22.2	13.3	11.4	26.8	14.7	9.2	31.1	16.1	6.4
	85	40	19.9	15.1	20.6	29.8	19.2	15.2	36.7	21.6	12.5	44.0	24.3	8.9
		42	18.8	14.7	19.5	28.1	18.6	14.4	34.5	20.8	11.7	41.2	23.2	8.4
		45	17.3	13.9	17.9	25.6	17.6	13.2	31.3	19.6	10.7	36.9	21.7	7.5
		48	15.7	13.1	16.4	23.1	16.7	11.9	28.0	18.4	9.6	32.5	20.1	6.6
	90	40	21.0	18.1	21.7	31.4	23.0	16.0	38.7	25.9	13.1	46.4	29.1	9.4
		42	19.9	17.5	20.6	29.7	22.3	15.2	36.4	24.9	12.4	43.4	27.8	8.8
		45	18.2	16.7	18.9	27.0	21.1	13.9	33.0	23.5	11.2	38.9	26.0	7.9
		48	16.5	15.7	17.2	24.4	20.0	12.5	29.5	22.1	10.1	34.2	24.1	7.0

Table 9. VUV 075, cooling coil F, 4-row / 12 fpi

Entering Wet Bulb Temp (°F)	Entering Dry Bulb Temp (°F)	Entering Water Temp (°F)	Flow Rate (gpm) 2 Total Capacity (MBh)	2 Sensible Capacity (MBh)	2 ΔT (°F)	4 Total Capacity (MBh)	4 Sensible Capacity (MBh)	4 ΔT (°F)	6 Total Capacity (MBh)	6 Sensible Capacity (MBh)	6 ΔT (°F)	10 Total Capacity (MBh)	10 Sensible Capacity (MBh)	10 ΔT (°F)
61	70	40	11.9	9.1	12.6	17.1	11.4	8.9	20.9	12.7	7.2	25.1	14.3	5.2
		42	11.2	8.8	11.9	16.1	11.0	8.4	19.6	12.3	6.8	23.5	13.7	4.8
		45	10.2	8.4	10.9	14.7	10.4	7.7	17.8	11.5	6.2	21.1	12.8	4.4
		48	9.2	7.9	9.9	13.2	9.8	6.9	15.9	10.8	5.5	18.6	11.8	3.9
	75	40	13.0	11.8	13.6	18.7	14.7	9.7	22.8	16.5	7.8	27.4	18.6	5.6
		42	12.3	11.4	12.9	17.6	14.2	9.1	21.4	15.9	7.4	25.7	17.8	5.3
		45	11.2	10.8	11.9	16.0	13.5	8.3	19.4	14.9	6.7	23.0	16.5	4.7
		48	10.1	10.1	10.8	14.4	12.7	7.5	17.3	14.0	6.0	20.3	15.3	4.2
	80	40	14.4	14.3	15.1	20.7	17.8	10.7	25.2	20.0	8.6	30.4	22.5	6.2
		42	13.6	13.6	14.3	19.5	17.2	10.1	23.8	19.2	8.1	28.5	21.5	5.8
		45	12.4	12.4	13.1	17.7	16.3	9.2	21.5	18.1	7.4	25.5	20.0	5.2
		48	11.2	11.2	11.9	15.9	15.3	8.3	19.2	17.0	6.6	22.5	18.6	4.6
	85	40	16.0	16.0	16.7	23.1	20.7	11.9	28.2	23.2	9.6	33.9	26.2	6.9
		42	15.2	15.2	15.8	21.8	20.0	11.2	26.5	22.4	9.1	31.8	25.0	6.5
		45	13.8	13.8	14.5	19.8	18.9	10.2	24.0	21.0	8.2	28.5	23.3	5.8
		48	12.5	12.5	13.1	17.8	17.8	9.2	21.4	19.7	7.4	25.1	21.6	5.2
	90	40	17.9	17.9	18.6	25.7	23.5	13.2	31.4	26.3	10.7	37.8	29.7	7.7
		42	16.9	16.9	17.6	24.3	22.7	12.5	29.6	25.3	10.1	35.4	28.3	7.2
		45	15.4	15.4	16.1	22.1	21.5	11.4	26.7	23.8	9.1	31.8	26.4	6.5
		48	13.9	13.9	14.6	19.8	19.8	10.2	23.9	22.3	8.2	28.0	24.5	5.7
67	75	40	16.2	9.8	16.9	23.3	12.2	12.0	28.5	13.7	9.7	34.3	15.4	7.0
		42	15.3	9.5	16.0	22.0	11.8	11.4	26.8	13.2	9.2	32.1	14.8	6.6
		45	14.0	9.0	14.7	20.0	11.2	10.3	24.2	12.4	8.3	28.8	13.7	5.9
		48	12.6	8.5	13.3	18.0	10.5	9.3	21.6	11.6	7.4	25.4	12.7	5.2
	80	40	17.0	12.7	17.7	24.5	15.8	12.6	29.9	17.7	10.2	35.9	20.0	7.3
		42	16.1	12.3	16.8	23.1	15.3	11.9	28.1	17.1	9.6	33.7	19.1	6.9
		45	14.7	11.7	15.3	21.0	14.5	10.8	25.4	16.1	8.7	30.2	17.8	6.2
		48	13.2	11.0	13.9	18.8	13.6	9.8	22.7	15.1	7.8	26.7	16.5	5.5
	85	40	18.1	15.5	18.8	26.1	19.3	13.4	31.8	21.7	10.8	38.3	24.4	7.8
		42	17.1	15.0	17.8	24.6	18.7	12.6	29.9	20.8	10.2	35.9	23.3	7.3
		45	15.6	14.2	16.3	22.4	17.7	11.5	27.1	19.6	9.3	32.2	21.7	6.6
		48	14.1	13.4	14.8	20.1	16.6	10.4	24.2	18.4	8.3	28.4	20.1	5.8
	90	40	19.4	18.2	20.1	28.0	22.7	14.3	34.1	25.4	11.6	41.0	28.7	8.3
		42	18.4	17.6	19.1	26.4	21.9	13.5	32.1	24.5	10.9	38.5	27.4	7.8
		45	16.7	16.7	17.4	24.0	20.7	12.3	29.1	23.0	9.9	34.5	25.5	7.0
		48	15.1	15.1	15.8	21.5	19.5	11.1	25.9	21.6	8.9	30.4	23.7	6.2
70	75	40	18.5	8.6	19.1	26.6	10.7	13.6	32.4	12.0	11.0	39.0	13.5	7.9
		42	17.4	8.3	18.1	25.1	10.3	12.9	30.5	11.5	10.4	36.5	12.9	7.4
		45	15.9	7.9	16.6	22.8	9.8	11.7	27.6	10.9	9.4	32.8	12.0	6.7
		48	14.3	7.4	15.0	20.4	9.2	10.6	24.6	10.2	8.4	28.9	11.2	5.9
	80	40	19.0	11.5	19.6	27.3	14.4	14.0	33.3	16.1	11.3	40.0	18.2	8.1
		42	17.9	11.2	18.6	25.7	13.9	13.2	31.3	15.5	10.7	37.5	17.3	7.6
		45	16.3	10.6	17.0	23.4	13.1	12.0	28.3	14.6	9.7	33.7	16.2	6.9
		48	14.7	10.0	15.4	21.0	12.4	10.8	25.3	13.7	8.7	29.7	15.0	6.1
	85	40	19.8	14.4	20.5	28.5	18.0	14.6	34.7	20.2	11.8	41.8	22.7	8.5
		42	18.7	14.0	19.4	26.9	17.4	13.8	32.7	19.4	11.1	39.2	21.7	8.0
		45	17.0	13.3	17.7	24.4	16.5	12.6	29.6	18.3	10.1	35.1	20.2	7.2
		48	15.4	12.5	16.1	21.9	15.5	11.3	26.4	17.1	9.0	31.0	18.8	6.3
	90	40	20.9	17.3	21.5	30.0	21.6	15.4	36.6	24.2	12.4	44.1	27.2	8.9
		42	19.7	16.7	20.4	28.3	20.8	14.5	34.5	23.3	11.7	41.3	26.0	8.4
		45	18.0	15.9	18.7	25.7	19.7	13.2	31.2	21.9	10.6	37.0	24.2	7.5
		48	16.2	14.9	16.9	23.1	18.6	11.9	27.8	20.5	9.5	32.7	22.5	6.7

Table 10. VUV 075, coil G, 4-row / 16 fpi

Entering Wet Bulb Temp (°F)	Entering Dry Bulb Temp (°F)	Entering Water Temp (°F)	Flow Rate (gpm) 2 Total Capacity (MBh)	2 Sensible Capacity (MBh)	2 ΔT (°F)	4 Total Capacity (MBh)	4 Sensible Capacity (MBh)	4 ΔT (°F)	6 Total Capacity (MBh)	6 Sensible Capacity (MBh)	6 ΔT (°F)	10 Total Capacity (MBh)	10 Sensible Capacity (MBh)	10 ΔT (°F)
61	70	40	12.0	9.0	12.7	17.3	11.2	9.0	21.0	12.6	7.2	25.1	14.1	5.2
		42	11.4	8.7	12.0	16.3	10.8	8.5	19.8	12.1	6.8	23.5	13.5	4.8
		45	10.4	8.2	11.0	14.8	10.2	7.8	17.9	11.3	6.2	21.1	12.6	4.4
		48	9.3	7.7	10.0	13.3	9.6	7.0	16.0	10.6	5.6	18.6	11.6	3.9
	75	40	13.1	11.6	13.8	18.9	14.5	9.8	22.9	16.3	7.9	27.3	18.3	5.6
		42	12.4	11.2	13.1	17.8	14.0	9.2	21.6	15.7	7.4	25.6	17.5	5.3
		45	11.3	10.7	12.0	16.2	13.2	8.4	19.6	14.7	6.7	23.0	16.3	4.7
		48	10.2	10.0	10.9	14.5	12.4	7.6	17.5	13.8	6.0	20.3	15.0	4.2
	80	40	14.6	14.1	15.2	20.9	17.6	10.8	25.4	19.7	8.7	30.3	22.2	6.2
		42	13.7	13.6	14.4	19.8	17.0	10.2	24.0	19.0	8.2	28.4	21.2	5.8
		45	12.5	12.5	13.2	18.0	16.0	9.3	21.7	17.8	7.5	25.5	19.7	5.2
		48	11.3	11.3	12.0	16.1	15.1	8.4	19.4	16.7	6.7	22.5	18.2	4.6
	85	40	16.2	16.2	16.9	23.4	20.5	12.0	28.4	22.9	9.7	33.8	25.8	6.9
		42	15.3	15.3	16.0	22.0	19.7	11.4	26.7	22.0	9.1	31.7	24.6	6.5
		45	14.0	14.0	14.7	20.0	18.6	10.4	24.2	20.7	8.3	28.5	22.9	5.8
		48	12.6	12.6	13.3	18.0	17.5	9.3	21.6	19.4	7.4	25.2	21.2	5.2
	90	40	18.1	18.1	18.8	26.0	23.2	13.4	31.6	26.0	10.8	37.7	29.2	7.7
		42	17.1	17.1	17.8	24.6	22.4	12.6	29.8	25.0	10.2	35.4	27.9	7.2
		45	15.6	15.6	16.3	22.3	21.1	11.5	27.0	23.5	9.2	31.8	26.0	6.5
		48	14.0	14.0	14.7	20.1	19.9	10.4	24.1	21.9	8.3	28.0	24.0	5.7
67	75	40	16.4	9.6	17.1	23.6	12.1	12.1	28.7	13.5	9.8	34.2	15.2	7.0
		42	15.5	9.3	16.2	22.3	11.6	11.5	27.0	13.0	9.2	32.1	14.5	6.6
		45	14.1	8.9	14.8	20.3	11.0	10.5	24.5	12.2	8.4	28.8	13.5	5.9
		48	12.7	8.3	13.4	18.2	10.3	9.4	21.8	11.4	7.5	25.4	12.5	5.2
	80	40	17.2	12.5	17.9	24.8	15.6	12.7	30.1	17.5	10.3	35.9	19.7	7.3
		42	16.3	12.1	17.0	23.4	15.1	12.0	28.4	16.8	9.7	33.7	18.8	6.9
		45	14.8	11.5	15.5	21.3	14.2	11.0	25.7	15.8	8.8	30.2	17.5	6.2
		48	13.3	10.8	14.0	19.1	13.4	9.9	22.9	14.8	7.9	26.7	16.2	5.5
	85	40	18.3	15.2	19.0	26.4	19.1	13.5	32.1	21.4	10.9	38.2	24.1	7.8
		42	17.3	14.8	18.0	24.9	18.4	12.8	30.2	20.5	10.3	35.8	23.0	7.3
		45	15.8	14.0	16.5	22.6	17.4	11.7	27.3	19.3	9.3	32.2	21.3	6.6
		48	14.2	13.2	14.9	20.3	16.3	10.5	24.4	18.0	8.4	28.4	19.7	5.8
	90	40	19.7	17.9	20.4	28.3	22.4	14.5	34.4	25.1	11.7	41.0	28.3	8.3
		42	18.6	17.3	19.3	26.7	21.6	13.7	32.4	24.1	11.0	38.4	27.0	7.8
		45	16.9	16.4	17.6	24.3	20.4	12.5	29.3	22.7	10.0	34.5	25.1	7.0
		48	15.2	15.2	15.9	21.8	19.2	11.2	26.2	21.2	9.0	30.5	23.2	6.2
70	75	40	18.7	8.4	19.4	26.9	10.6	13.8	32.7	11.8	11.1	38.9	13.3	7.9
		42	17.6	8.2	18.3	25.4	10.2	13.0	30.8	11.4	10.5	36.5	12.7	7.4
		45	16.1	7.7	16.8	23.1	9.6	11.9	27.9	10.7	9.5	32.8	11.8	6.7
		48	14.5	7.3	15.2	20.7	9.0	10.7	24.9	10.0	8.5	28.9	10.9	5.9
	80	40	19.2	11.3	19.9	27.6	14.2	14.1	33.5	15.9	11.4	40.0	17.9	8.1
		42	18.1	11.0	18.8	26.0	13.7	13.4	31.6	15.3	10.8	37.5	17.1	7.6
		45	16.5	10.4	17.2	23.7	12.9	12.2	28.6	14.4	9.8	33.7	15.9	6.9
		48	14.9	9.8	15.6	21.3	12.1	11.0	25.5	13.4	8.7	29.7	14.7	6.1
	85	40	20.0	14.2	20.7	28.8	17.8	14.7	35.0	19.9	11.9	41.7	22.4	8.5
		42	18.9	13.7	19.6	27.2	17.1	13.9	33.0	19.1	11.2	39.1	21.4	8.0
		45	17.2	13.0	17.9	24.7	16.2	12.7	29.9	18.0	10.2	35.1	19.9	7.2
		48	15.5	12.3	16.2	22.2	15.2	11.4	26.7	16.8	9.1	31.0	18.4	6.3
	90	40	21.1	17.0	21.8	30.4	21.3	15.5	36.9	23.9	12.5	44.0	26.8	8.9
		42	19.9	16.5	20.6	28.7	20.5	14.7	34.8	22.9	11.8	41.3	25.6	8.4
		45	18.2	15.6	18.9	26.1	19.4	13.4	31.5	21.5	10.7	37.0	23.8	7.5
		48	16.4	14.7	17.0	23.4	18.2	12.0	28.1	20.1	9.6	32.7	22.0	6.7

Table 11. VUV 075, cooling coil H, 3-row / 16 fpi

Entering Wet Bulb Temp (°F)	Entering Dry Bulb Temp (°F)	Entering Water Temp (°F)	Flow Rate (gpm) 2 Total Capacity (MBh)	2 Sensible Capacity (MBh)	2 ΔT (°F)	4 Total Capacity (MBh)	4 Sensible Capacity (MBh)	4 ΔT (°F)	6 Total Capacity (MBh)	6 Sensible Capacity (MBh)	6 ΔT (°F)	10 Total Capacity (MBh)	10 Sensible Capacity (MBh)	10 ΔT (°F)
61	70	40	13.8	10.5	14.5	20.1	12.7	10.4	23.2	13.8	8.0	26.1	14.9	5.4
		42	13.2	10.3	13.8	19.0	12.3	9.8	21.8	13.3	7.5	24.6	14.2	5.0
		45	12.1	9.9	12.8	17.2	11.7	8.9	19.8	12.5	6.8	22.2	13.3	4.6
		48	11.0	9.5	11.7	15.4	11.1	8.0	17.6	11.8	6.1	19.7	12.4	4.1
	75	40	15.0	13.6	15.7	21.9	16.5	11.3	25.3	17.9	8.7	28.5	19.2	5.8
		42	14.3	13.3	15.0	20.7	15.9	10.7	23.8	17.2	8.2	26.8	18.4	5.5
		45	13.2	12.8	13.9	18.8	15.1	9.7	21.5	16.2	7.4	24.2	17.2	5.0
		48	12.0	12.0	12.7	16.8	14.3	8.7	19.2	15.2	6.6	21.5	16.1	4.4
	80	40	16.7	16.4	17.4	24.3	19.9	12.5	28.1	21.7	9.6	31.6	23.3	6.5
		42	15.9	15.9	16.6	22.9	19.3	11.8	26.4	20.8	9.0	29.7	22.3	6.1
		45	14.7	14.7	15.4	20.8	18.3	10.8	23.9	19.6	8.2	26.8	20.9	5.5
		48	13.3	13.3	14.0	18.6	17.4	9.6	21.3	18.5	7.3	23.8	19.5	4.9
	85	40	18.6	18.6	19.3	27.1	23.2	13.9	31.3	25.2	10.7	35.3	27.1	7.2
		42	17.8	17.8	18.4	25.6	22.4	13.1	29.5	24.2	10.1	33.1	25.9	6.8
		45	16.4	16.4	17.1	23.2	21.3	12.0	26.7	22.8	9.1	29.9	24.3	6.1
		48	14.9	14.9	15.6	20.8	20.2	10.7	23.7	21.5	8.1	26.6	22.7	5.5
	90	40	20.8	20.8	21.4	30.3	26.3	15.5	34.9	28.6	11.9	39.3	30.7	8.0
		42	19.8	19.8	20.5	28.5	25.4	14.6	32.9	27.5	11.2	37.0	29.4	7.5
		45	18.3	18.3	18.9	25.9	24.1	13.3	29.7	25.8	10.1	33.3	27.5	6.8
		48	16.6	16.6	17.3	23.2	22.9	11.9	26.5	24.3	9.1	29.6	25.7	6.1
67	75	40	18.8	11.3	19.5	27.4	13.7	14.1	31.7	14.9	10.8	35.6	16.0	7.3
		42	17.9	11.0	18.6	25.9	13.2	13.3	29.8	14.3	10.2	33.5	15.3	6.8
		45	16.5	10.7	17.2	23.5	12.6	12.1	27.0	13.5	9.2	30.2	14.3	6.2
		48	15.0	10.2	15.7	21.0	11.9	10.8	24.0	12.7	8.2	26.9	13.4	5.5
	80	40	19.8	14.6	20.4	28.8	17.7	14.7	33.2	19.2	11.3	37.4	20.7	7.6
		42	18.8	14.3	19.5	27.2	17.1	13.9	31.3	18.5	10.7	35.2	19.8	7.2
		45	17.4	13.8	18.0	24.6	16.2	12.7	28.3	17.4	9.7	31.7	18.5	6.5
		48	15.8	13.3	16.5	22.0	15.4	11.4	25.2	16.4	8.6	28.2	17.3	5.8
	85	40	21.0	17.8	21.7	30.6	21.6	15.7	35.4	23.5	12.0	39.8	25.3	8.1
		42	20.0	17.4	20.7	28.9	20.9	14.8	33.3	22.6	11.3	37.4	24.2	7.6
		45	18.5	16.8	19.2	26.2	19.8	13.5	30.1	21.3	10.3	33.8	22.6	6.9
		48	16.8	16.2	17.5	23.5	18.8	12.1	26.8	20.0	9.2	30.0	21.1	6.1
	90	40	22.6	20.9	23.2	32.9	25.4	16.8	38.0	27.6	12.9	42.7	29.7	8.7
		42	21.5	20.5	22.2	31.0	24.6	15.9	35.7	26.5	12.1	40.2	28.4	8.2
		45	19.8	19.8	20.5	28.2	23.3	14.4	32.3	25.0	11.0	36.2	26.6	7.4
		48	18.0	18.0	18.7	25.2	22.1	12.9	28.8	23.5	9.8	32.2	24.8	6.6
70	75	40	21.4	9.9	22.1	31.2	12.0	16.0	36.0	13.0	12.2	40.6	14.0	8.3
		42	20.4	9.7	21.1	29.5	11.6	15.1	33.9	12.5	11.5	38.1	13.4	7.8
		45	18.8	9.3	19.5	26.7	11.0	13.7	30.7	11.8	10.5	34.4	12.5	7.0
		48	17.1	9.0	17.8	23.9	10.4	12.3	27.3	11.1	9.3	30.6	11.7	6.3
	80	40	22.0	13.3	22.7	32.1	16.1	16.4	37.0	17.5	12.6	41.7	18.8	8.5
		42	21.0	13.0	21.7	30.3	15.6	15.5	34.8	16.8	11.8	39.2	18.0	8.0
		45	19.3	12.5	20.0	27.5	14.8	14.1	31.5	15.8	10.7	35.3	16.8	7.2
		48	17.6	12.0	18.3	24.6	14.0	12.6	28.1	14.9	9.6	31.4	15.7	6.4
	85	40	23.0	16.6	23.7	33.5	20.1	17.1	38.6	21.9	13.1	43.5	23.5	8.8
		42	21.9	16.3	22.6	31.6	19.5	16.1	36.4	21.0	12.4	40.9	22.5	8.3
		45	20.2	15.7	20.9	28.7	18.5	14.7	32.9	19.8	11.2	36.9	21.1	7.5
		48	18.4	15.1	19.0	25.6	17.5	13.2	29.3	18.6	10.0	32.8	19.7	6.7
	90	40	24.2	19.9	24.9	35.3	24.1	18.0	40.7	26.2	13.8	45.8	28.2	9.3
		42	23.1	19.5	23.8	33.3	23.3	17.0	38.3	25.2	13.0	43.1	27.0	8.8
		45	21.3	18.8	22.0	30.2	22.1	15.4	34.7	23.7	11.8	38.9	25.2	7.9
		48	19.4	18.1	20.0	27.0	21.0	13.8	30.9	22.3	10.5	34.5	23.6	7.0

Table 12. VUV 075, cooling coil J (DX)

Size	EWB	Suct Temp	EDB = 70°F				EDB = 75°F				EDB = 80°F				EDB = 85°F			
			TC	SC	LDB	LWB	TC	SC	LDB	LWB	TC	SC	LDB	LWB	TC	SC	LDB	LWB
750	61	40	22.8	15.0	51.4	50.0	25.0	19.9	50.4	48.8	27.7	24.3	49.9	47.2	30.9	28.5	49.7	45.4
		45	19.1	13.7	53.0	52.0	20.9	18.1	52.6	51.0	23.2	22.1	52.6	49.7	25.9	25.9	52.9	48.2
		50	15.4	12.3	54.8	53.8	16.9	16.2	54.9	53.1	18.7	18.7	56.9	52.1	20.9	20.9	59.1	50.9
	64	40	27.1	13.0	53.9	51.6	28.6	18.3	52.3	50.8	30.4	23.2	51.3	49.8	32.7	27.9	50.5	48.5
		45	22.7	11.8	55.4	53.9	23.9	16.6	54.5	53.2	25.5	21.1	53.9	52.3	27.4	25.3	53.7	51.3
		50	18.3	10.6	56.9	56.0	19.3	14.9	56.6	55.5	20.6	19.0	56.5	54.8	22.1	22.1	57.6	54.0
	67	40	32.1	10.4	57.1	53.1	33.1	16.0	55.2	52.5	34.3	21.3	53.6	51.8	35.9	26.3	52.4	50.9
		45	26.9	9.4	58.4	55.7	27.8	14.5	57.1	55.1	28.8	19.3	56.1	54.6	30.1	23.9	55.4	53.9
		50	21.7	8.5	59.5	58.1	22.4	13.1	58.8	57.7	23.2	17.4	58.5	57.2	24.3	21.5	58.4	56.7
	70	40					38.4	13.2	58.7	54.1	39.2	18.7	56.9	53.6	40.3	24.0	55.3	53.0
		45					32.2	12.0	60.1	57.0	32.9	17.0	59.0	56.6	33.7	21.9	57.9	56.2
		50					26.0	10.8	61.6	59.8	26.5	15.3	61.1	59.5	27.2	19.7	60.6	59.2
	73	40									44.8	15.6	60.7	55.3	45.6	21.1	58.9	54.8
		45									37.6	14.2	62.4	58.6	38.2	19.2	61.2	58.3
		50									30.3	12.8	64.2	61.8	30.8	17.3	63.6	61.5

EDB = Entering Air Temperature, Dry Bulb (°F)
EWB = Entering Air Temperature, Wet Bulb (°F)
TC = Total Capacity (MBh)
SC = Sensible Capacity (MBh)
LDB = Leaving Air Temperature, Dry Bulb (°F)
LWB = Leaving Air Temperature, Wet Bulb (°F)

Table 13. Airflow correction (% of design airflow)

%	Total Capacity (MBh)	Sensible Capacity (MBh)
120	1.025	1.105
110	1.012	1.051
100	1.000	0.998
90	0.987	0.945
80	0.974	0.892

Table 14. Airflow through coil J

Unit Model	0750
Rated cfm	748

Table 15. VUV 075, hydronic heating coils A (1-row / 12 fpi), B (2-row / 12 fpi), C (2-row / 16 fpi)

			Flow Rate (gpm)					
			2		4		6	
Coil	Entering Air Temp, Dry Bulb (°F)	Entering Water Temp (°F)	Total Capacity (MBh)	Waterside Temp Drop (°F)	Total Capacity (MBh)	Waterside Temp Drop (°F)	Total Capacity (MBh)	Waterside Temp Drop (°F)
A	50	120	19.7	19.0	22.9	11.1	24.3	7.9
		140	27.5	26.8	32.1	15.7	34.1	11.1
		160	35.5	34.8	41.4	20.4	43.9	14.4
		180	43.5	42.8	50.8	25.1	53.7	17.7
	55	120	18.6	17.9	21.7	10.5	23.0	7.4
		140	26.0	25.3	30.4	14.9	32.2	10.5
		160	33.5	32.8	39.2	19.3	41.5	13.6
		180	41.2	40.5	48.0	23.7	50.8	16.7
	60	120	17.5	16.8	20.4	9.9	21.7	7.0
		140	24.6	23.9	28.7	14.0	30.4	9.9
		160	31.6	30.9	36.9	18.1	39.2	12.8
		180	38.8	38.1	45.3	22.3	47.9	15.7
	65	120	16.5	15.8	19.2	9.3	20.4	6.6
		140	23.1	22.4	26.9	13.1	28.6	9.3
		160	29.7	29.0	34.7	17.0	36.8	12.0
		180	36.5	35.8	42.6	21.0	45.1	14.8
	70	120	15.4	14.7	18.0	8.7	19.1	6.1
		140	21.6	20.9	25.2	12.3	26.7	8.7
		160	27.8	27.1	32.5	15.9	34.4	11.2
		180	34.2	33.5	39.8	19.6	42.2	13.8
B	50	120	27.3	26.6	34.4	16.9	37.6	12.3
		140	38.4	37.7	48.5	23.9	52.9	17.4
		160	49.7	49.0	62.7	31.0	68.2	22.5
		180	61.2	60.5	77.0	38.2	83.7	27.7
	55	120	25.9	25.2	32.5	15.9	35.5	11.6
		140	36.3	35.6	45.9	22.6	50.0	16.4
		160	47.0	46.3	59.3	29.3	64.6	21.3
		180	57.9	57.2	72.8	36.1	79.2	26.2
	60	120	24.4	23.7	30.7	15.0	33.5	10.9
		140	34.3	33.6	43.3	21.3	47.2	15.5
		160	44.4	43.7	55.9	27.6	60.9	20.1
		180	54.6	53.9	68.7	34.0	74.7	24.7
	65	120	22.9	22.2	28.9	14.1	31.5	10.3
		140	32.2	31.5	40.7	20.0	44.4	14.6
		160	41.7	41.0	52.6	26.0	57.3	18.9
		180	51.4	50.7	64.6	32.0	70.2	23.2
	70	120	21.5	20.8	27.0	13.2	29.5	9.6
		140	30.1	29.4	38.1	18.7	41.5	13.6
		160	39.0	38.3	49.2	24.3	53.6	17.6
		180	48.1	47.4	60.4	29.9	65.7	21.7
C	50	120	28.3	27.6	36.1	17.7	39.5	12.9
		140	39.9	39.2	50.9	25.1	55.5	18.3
		160	51.7	51.0	65.7	32.5	71.6	23.6
		180	63.6	62.9	80.7	40.0	87.8	29.0
	55	120	26.8	26.1	34.2	16.8	37.3	12.2
		140	37.7	37.0	48.1	23.7	52.5	17.3
		160	48.9	48.2	62.2	30.8	67.8	22.4
		180	60.2	59.5	76.3	37.8	83.1	27.5
	60	120	25.3	24.6	32.2	15.8	35.2	11.5
		140	35.6	34.9	45.4	22.4	49.5	16.3
		160	46.1	45.4	58.7	29.0	63.9	21.1
		180	56.8	56.1	72.0	35.7	78.4	25.9
	65	120	23.8	23.1	30.3	14.8	33.1	10.8
		140	33.5	32.8	42.7	21.0	46.6	15.3
		160	43.3	42.6	55.1	27.2	60.1	19.8
		180	53.4	52.7	67.7	33.5	73.7	24.3
	70	120	22.2	21.5	28.3	13.8	31.0	10.1
		140	31.3	30.6	39.9	19.6	43.6	14.3
		160	40.6	39.9	51.6	25.5	56.2	18.5
		180	50.0	49.3	63.4	31.4	68.9	22.7

Table 16. VUV 075, steam heating coil K (low-capacity), L (high-capacity)

			Steam Pressure (psig)					
			5		10		15	
Size	Coil	Entering Air Temp, Dry Bulb (°F)	Total Capacity (MBh)	Airside Temp Rise (°F)	Total Capacity (MBh)	Airside Temp Rise (°F)	Total Capacity (MBh)	Airside Temp Rise (°F)
750	K	0	68.7	84.8	72.3	89.2	75.3	93.0
		10	65.7	81.1	69.3	85.5	72.3	89.2
		20	62.7	77.4	66.2	81.8	69.3	85.5
		30	59.7	73.6	63.2	78.0	66.3	81.8
		40	56.6	69.9	60.2	74.3	63.2	78.1
		50	53.6	66.2	57.1	70.6	60.2	74.3
		60	50.6	62.4	54.1	66.8	57.2	70.6
		70	47.5	58.7	51.1	63.1	54.2	66.9
	L	0	81.2	100.2	85.4	105.4	89.0	109.9
		10	77.6	95.8	81.8	101.0	85.4	105.4
		20	74.0	91.4	78.2	96.6	81.8	101.0
		30	70.4	87.0	74.7	92.2	78.3	96.6
		40	66.9	82.6	71.1	87.8	74.7	92.2
		50	63.3	78.2	67.5	83.4	71.1	87.8
		60	59.7	73.7	63.9	78.9	67.5	83.4
		70	56.2	69.4	60.4	74.6	64.0	79.0

psig = Steam Pressure (lb/in.^{2} gage)

Table 17. VUV 100, cooling coil E, 3-row / 16 fpi

Entering Wet Bulb Temp (°F)	Entering Dry Bulb Temp (°F)	Entering Water Temp (°F)	Flow Rate (gpm) 2 Total Capacity (MBh)	2 Sensible Capacity (MBh)	2 ΔT (°F)	4 Total Capacity (MBh)	4 Sensible Capacity (MBh)	4 ΔT (°F)	6 Total Capacity (MBh)	6 Sensible Capacity (MBh)	6 ΔT (°F)	10 Total Capacity (MBh)	10 Sensible Capacity (MBh)	10 ΔT (°F)
61	70	40	12.6	11.3	13.5	18.6	14.3	9.7	23.2	16.1	8.0	29.2	18.1	6.0
		42	12.0	11.0	12.9	17.7	13.9	9.3	22.0	15.6	7.6	27.6	17.5	5.7
		45	11.0	10.4	11.9	16.2	13.4	8.6	20.2	14.9	7.0	25.1	16.6	5.2
		48	9.9	9.7	10.9	14.7	12.7	7.8	18.3	14.2	6.4	22.5	15.6	4.7
	75	40	13.7	13.7	14.7	20.3	18.5	10.6	25.3	20.8	8.7	31.9	23.5	6.6
		42	13.1	13.1	14.0	19.3	18.1	10.1	24.0	20.2	8.3	30.1	22.7	6.2
		45	12.0	12.0	12.9	17.7	17.3	9.3	22.0	19.3	7.6	27.4	21.5	5.7
		48	10.9	10.9	11.8	16.1	16.1	8.5	19.9	18.4	6.9	24.6	20.3	5.1
	80	40	15.2	15.2	16.2	22.5	22.4	11.7	28.1	25.2	9.7	35.4	28.5	7.3
		42	14.5	14.5	15.4	21.4	21.4	11.1	26.7	24.5	9.2	33.4	27.5	6.9
		45	13.4	13.4	14.3	19.7	19.7	10.3	24.4	23.4	8.4	30.4	26.0	6.3
		48	12.0	12.0	12.9	17.8	17.8	9.4	22.1	22.1	7.7	27.3	24.5	5.6
	85	40	17.0	17.0	17.9	25.1	25.1	13.0	31.4	29.3	10.8	39.5	33.1	8.1
		42	16.2	16.2	17.1	23.9	23.9	12.4	29.8	28.5	10.2	37.3	31.9	7.6
		45	14.9	14.9	15.8	21.9	21.9	11.4	27.3	27.2	9.4	33.9	30.2	7.0
		48	13.4	13.4	14.3	19.9	19.9	10.4	24.7	24.7	8.5	30.4	28.5	6.3
	90	40	19.0	19.0	19.9	28.0	28.0	14.4	35.0	33.2	12.0	44.0	37.5	9.0
		42	18.1	18.1	19.0	26.6	26.6	13.8	33.2	32.3	11.4	41.5	36.2	8.5
		45	16.6	16.6	17.5	24.4	24.4	12.7	30.4	30.4	10.4	37.8	34.3	7.7
		48	15.0	15.0	15.9	22.2	22.2	11.5	27.5	27.5	9.5	33.9	32.3	7.0
67	75	40	17.2	12.2	18.1	25.4	15.4	13.1	31.7	17.3	10.9	39.9	19.5	8.2
		42	16.4	11.8	17.3	24.1	15.0	12.5	30.1	16.8	10.3	37.7	18.8	7.7
		45	15.1	11.2	16.0	22.2	14.4	11.5	27.6	16.1	9.5	34.2	17.8	7.0
		48	13.6	10.5	14.5	20.1	13.7	10.5	24.9	15.3	8.6	30.8	16.8	6.3
	80	40	18.0	15.8	18.9	26.6	19.9	13.8	33.3	22.4	11.4	41.9	25.3	8.6
		42	17.2	15.3	18.1	25.3	19.4	13.1	31.5	21.8	10.8	39.5	24.4	8.1
		45	15.8	14.5	16.7	23.3	18.6	12.1	28.9	20.8	9.9	35.9	23.1	7.4
		48	14.2	13.6	15.1	21.1	17.7	11.0	26.2	19.8	9.0	32.3	21.8	6.6
	85	40	19.2	19.2	20.1	28.3	24.3	14.6	35.4	27.3	12.1	44.6	30.8	9.1
		42	18.3	18.3	19.2	26.9	23.7	13.9	33.6	26.6	11.5	42.1	29.8	8.6
		45	16.8	16.8	17.7	24.8	22.7	12.8	30.8	25.4	10.6	38.2	28.2	7.8
		48	15.2	15.2	16.1	22.4	21.6	11.7	27.9	24.1	9.6	34.4	26.6	7.1
	90	40	20.6	20.6	21.5	30.4	28.6	15.7	38.0	32.1	13.0	47.8	36.3	9.7
		42	19.6	19.6	20.5	28.9	27.9	14.9	36.0	31.2	12.3	45.1	35.0	9.2
		45	18.1	18.1	19.0	26.6	26.6	13.7	33.0	29.8	11.3	41.0	33.1	8.4
		48	16.3	16.3	17.2	24.1	24.1	12.5	29.9	28.4	10.3	36.9	31.2	7.6
70	75	40	19.6	10.7	20.5	28.9	13.5	14.9	36.1	15.1	12.3	45.4	17.1	9.3
		42	18.7	10.4	19.6	27.5	13.1	14.2	34.2	14.7	11.7	42.9	16.5	8.8
		45	17.1	9.8	18.0	25.2	12.6	13.1	31.4	14.1	10.8	39.0	15.6	8.0
		48	15.4	9.2	16.4	22.9	12.0	11.9	28.4	13.4	9.8	35.0	14.7	7.2
	80	40	20.1	14.3	21.0	29.7	18.1	15.3	37.1	20.3	12.7	46.6	23.0	9.5
		42	19.2	13.9	20.1	28.2	17.6	14.6	35.2	19.8	12.0	44.0	22.1	9.0
		45	17.6	13.2	18.5	25.9	16.9	13.4	32.2	18.9	11.0	40.0	21.0	8.2
		48	15.9	12.3	16.8	23.5	16.1	12.2	29.2	18.0	10.0	36.0	19.8	7.4
	85	40	21.0	17.9	21.9	31.0	22.7	15.9	38.7	25.5	13.2	48.7	28.7	9.9
		42	20.0	17.4	20.9	29.4	22.1	15.2	36.7	24.8	12.5	45.9	27.7	9.4
		45	18.4	16.5	19.3	27.0	21.2	14.0	33.6	23.7	11.5	41.8	26.3	8.5
		48	16.6	15.4	17.5	24.5	20.1	12.7	30.4	22.5	10.4	37.5	24.8	7.7
	90	40	22.1	21.5	23.0	32.6	27.1	16.8	40.8	30.5	13.9	51.3	34.4	10.4
		42	21.1	20.9	22.0	31.0	26.5	16.0	38.7	29.6	13.2	48.4	33.2	9.9
		45	19.4	19.4	20.3	28.5	25.4	14.7	35.4	28.3	12.1	44.0	31.4	9.0
		48	17.5	17.5	18.4	25.8	24.1	13.4	32.1	26.9	11.0	39.6	29.7	8.1

Table 18. VUV 100, cooling coil F, 4-row / 12 fpi

Entering Wet Bulb Temp (°F)	Entering Dry Bulb Temp (°F)	Entering Water Temp (°F)	Flow Rate (gpm) 2 Total Capacity (MBh)	2 Sensible Capacity (MBh)	2 ΔT (°F)	4 Total Capacity (MBh)	4 Sensible Capacity (MBh)	4 ΔT (°F)	6 Total Capacity (MBh)	6 Sensible Capacity (MBh)	6 ΔT (°F)	10 Total Capacity (MBh)	10 Sensible Capacity (MBh)	10 ΔT (°F)
61	70	40	12.4	11.3	13.3	19.3	14.1	10.1	24.1	15.8	8.3	29.7	17.9	6.1
		42	11.8	11.0	12.7	18.4	13.8	9.6	22.8	15.4	7.9	28.0	17.3	5.8
		45	10.8	10.4	11.7	16.9	13.2	8.9	20.9	14.7	7.3	25.5	16.3	5.3
		48	9.7	9.7	10.6	15.3	12.6	8.1	19.0	14.0	6.6	23.0	15.3	4.8
	75	40	13.6	13.6	14.5	21.1	18.3	11.0	26.2	20.5	9.0	32.3	23.2	6.7
		42	12.9	12.9	13.8	20.0	17.8	10.5	24.9	19.9	8.6	30.6	22.4	6.3
		45	11.7	11.7	12.7	18.4	17.1	9.7	22.8	19.0	7.9	27.9	21.1	5.8
		48	10.6	10.6	11.5	16.7	16.3	8.8	20.7	18.1	7.2	25.1	19.9	5.2
	80	40	15.0	15.0	15.9	23.4	22.2	12.1	29.1	24.8	10.0	35.9	28.1	7.4
		42	14.3	14.3	15.2	22.2	21.6	11.6	27.6	24.1	9.5	33.9	27.1	7.0
		45	13.0	13.0	13.9	20.4	20.4	10.7	25.3	23.0	8.7	30.9	25.5	6.4
		48	11.7	11.7	12.6	18.5	18.5	9.7	23.0	21.9	8.0	27.8	24.0	5.7
	85	40	16.8	16.8	17.7	26.1	25.8	13.5	32.5	28.9	11.1	40.0	32.7	8.2
		42	15.9	15.9	16.8	24.8	24.8	12.8	30.8	28.0	10.6	37.8	31.5	7.7
		45	14.5	14.5	15.4	22.8	22.8	11.8	28.3	26.8	9.7	34.5	29.7	7.1
		48	13.1	13.1	14.0	20.7	20.7	10.8	25.7	25.5	8.9	31.0	28.0	6.4
	90	40	18.7	18.7	19.6	29.1	29.1	15.0	36.2	32.8	12.4	44.6	37.1	9.1
		42	17.7	17.7	18.6	27.6	27.6	14.3	34.4	31.8	11.8	42.2	35.7	8.6
		45	16.2	16.2	17.1	25.4	25.4	13.1	31.5	30.3	10.8	38.4	33.7	7.9
		48	14.6	14.6	15.5	23.0	23.0	12.0	28.6	28.6	9.8	34.6	31.7	7.1
67	75	40	17.0	12.2	17.9	26.4	15.2	13.6	32.8	17.0	11.2	40.5	19.3	8.3
		42	16.1	11.8	17.0	25.1	14.8	13.0	31.1	16.5	10.7	38.2	18.6	7.8
		45	14.7	11.2	15.6	23.0	14.2	12.0	28.6	15.8	9.8	34.8	17.5	7.1
		48	13.2	10.6	14.1	20.9	13.5	10.9	25.9	15.0	8.9	31.4	16.5	6.5
	80	40	17.8	15.7	18.7	27.7	19.7	14.3	34.4	22.1	11.8	42.5	25.0	8.7
		42	16.9	15.3	17.8	26.3	19.2	13.6	32.7	21.4	11.2	40.1	24.1	8.2
		45	15.4	14.6	16.3	24.1	18.4	12.5	30.0	20.4	10.3	36.6	22.7	7.5
		48	13.9	13.7	14.8	21.9	17.5	11.4	27.2	19.4	9.4	32.9	21.3	6.8
	85	40	18.9	18.9	19.8	29.5	24.0	15.2	36.7	26.9	12.5	45.2	30.5	9.2
		42	18.0	18.0	18.9	28.0	23.4	14.4	34.8	26.1	11.9	42.7	29.4	8.7
		45	16.4	16.4	17.3	25.7	22.4	13.3	31.9	24.9	10.9	38.9	27.7	8.0
		48	14.8	14.8	15.7	23.3	21.4	12.1	29.0	23.7	10.0	35.0	26.1	7.2
	90	40	20.3	20.3	21.2	31.6	28.2	16.3	39.3	31.7	13.4	48.5	35.8	9.9
		42	19.3	19.3	20.2	30.0	27.5	15.5	37.3	30.7	12.7	45.8	34.5	9.3
		45	17.6	17.6	18.5	27.6	26.3	14.2	34.3	29.3	11.7	41.8	32.5	8.5
		48	15.9	15.9	16.8	25.0	25.0	13.0	31.1	27.9	10.7	37.6	30.6	7.7
70	75	40	19.3	10.6	20.2	30.0	13.3	15.5	37.4	14.9	12.8	46.1	16.9	9.4
		42	18.3	10.3	19.2	28.5	13.0	14.7	35.5	14.5	12.1	43.5	16.3	8.9
		45	16.7	9.8	17.6	26.2	12.4	13.6	32.5	13.8	11.1	39.7	15.3	8.1
		48	15.1	9.3	16.0	23.8	11.8	12.3	29.5	13.1	10.1	35.7	14.4	7.3
	80	40	19.8	14.3	20.7	30.8	17.9	15.9	38.4	20.0	13.1	47.3	22.7	9.6
		42	18.8	13.9	19.7	29.3	17.4	15.1	36.4	19.4	12.4	44.7	21.8	9.1
		45	17.2	13.2	18.1	26.9	16.7	13.9	33.4	18.6	11.4	40.7	20.6	8.3
		48	15.5	12.5	16.4	24.4	15.9	12.7	30.3	17.7	10.4	36.7	19.4	7.5
	85	40	20.7	17.9	21.6	32.2	22.4	16.5	40.0	25.1	13.7	49.4	28.4	10.1
		42	19.6	17.4	20.5	30.6	21.8	15.7	38.0	24.4	13.0	46.7	27.4	9.5
		45	17.9	16.6	18.8	28.1	20.9	14.5	34.9	23.2	11.9	42.5	25.8	8.7
		48	16.1	15.6	17.0	25.5	19.9	13.2	31.6	22.1	10.8	38.3	24.3	7.8
	90	40	21.8	21.4	22.7	33.9	26.8	17.4	42.2	30.1	14.4	52.0	34.0	10.6
		42	20.7	20.7	21.6	32.2	26.1	16.6	40.1	29.2	13.7	49.2	32.8	10.0
		45	18.9	18.9	19.8	29.6	25.0	15.3	36.8	27.8	12.6	44.8	30.9	9.1
		48	17.0	17.0	17.9	26.9	23.9	13.9	33.4	26.5	11.4	40.3	29.1	8.2

Table 19. VUV 100, cooling coil G, 4-row / 16 fpi

Entering Wet Bulb Temp (°F)	Entering Dry Bulb Temp (°F)	Entering Water Temp (°F)	Flow Rate (gpm) 2 Total Capacity (MBh)	2 Sensible Capacity (MBh)	2 ΔT (°F)	4 Total Capacity (MBh)	4 Sensible Capacity (MBh)	4 ΔT (°F)	6 Total Capacity (MBh)	6 Sensible Capacity (MBh)	6 ΔT (°F)	10 Total Capacity (MBh)	10 Sensible Capacity (MBh)	10 ΔT (°F)
61	70	40	15.0	13.1	15.9	22.9	17.1	11.9	28.8	19.4	9.9	35.9	22.3	7.4
		42	14.2	12.7	15.1	21.7	16.5	11.3	27.2	18.7	9.4	33.7	21.3	6.9
		45	13.0	12.0	13.9	19.7	15.7	10.3	24.6	17.7	8.5	30.3	19.9	6.2
		48	11.7	11.3	12.6	17.8	14.8	9.3	22.1	16.6	7.7	26.8	18.5	5.5
	75	40	16.3	16.3	17.2	25.0	22.1	13.0	31.4	25.2	10.8	39.1	28.9	8.0
		42	15.5	15.5	16.4	23.6	21.4	12.3	29.6	24.3	10.2	36.7	27.6	7.5
		45	14.1	14.1	15.0	21.5	20.3	11.2	26.9	22.9	9.3	33.0	25.8	6.8
		48	12.8	12.8	13.7	19.4	19.2	10.1	24.1	21.6	8.3	29.2	24.0	6.0
	80	40	18.1	18.1	19.0	27.7	26.8	14.3	34.9	30.5	11.9	43.4	34.9	8.9
		42	17.2	17.2	18.1	26.2	25.9	13.6	32.9	29.4	11.3	40.7	33.4	8.3
		45	15.7	15.7	16.6	23.9	23.9	12.4	29.8	27.8	10.2	36.6	31.2	7.5
		48	14.2	14.2	15.1	21.5	21.5	11.2	26.7	26.1	9.2	32.4	29.0	6.7
	85	40	20.2	20.2	21.1	31.0	31.0	15.9	38.9	35.5	13.3	48.4	40.7	9.9
		42	19.1	19.1	20.0	29.2	29.2	15.1	36.7	34.2	12.5	45.4	38.9	9.3
		45	17.5	17.5	18.4	26.6	26.6	13.8	33.3	32.3	11.4	40.9	36.3	8.4
		48	15.8	15.8	16.7	24.0	24.0	12.4	29.8	29.8	10.2	36.2	33.8	7.4
	90	40	22.6	22.6	23.5	34.5	34.5	17.7	43.4	40.2	14.8	54.0	46.1	11.0
		42	21.3	21.3	22.2	32.6	32.6	16.8	40.9	38.8	13.9	50.7	44.1	10.3
		45	19.5	19.5	20.4	29.7	29.7	15.3	37.1	36.6	12.7	45.6	41.1	9.3
		48	17.6	17.6	18.5	26.7	26.7	13.8	33.2	33.2	11.4	40.3	38.2	8.2
67	75	40	20.4	14.1	21.4	31.3	18.4	16.1	39.3	20.9	13.4	48.9	24.0	10.0
		42	19.3	13.7	20.3	29.6	17.8	15.2	37.1	20.2	12.7	45.9	22.9	9.4
		45	17.7	12.9	18.6	26.9	16.9	13.9	33.6	19.0	11.5	41.3	21.4	8.4
		48	16.0	12.2	16.9	24.2	16.0	12.6	30.1	17.9	10.3	36.6	19.9	7.5
	80	40	21.5	18.3	22.4	32.8	23.8	16.9	41.3	27.1	14.1	51.4	31.0	10.5
		42	20.3	17.7	21.2	31.0	23.0	16.0	38.9	26.1	13.3	48.2	29.7	9.8
		45	18.5	16.8	19.4	28.3	21.9	14.6	35.3	24.7	12.1	43.3	27.7	8.8
		48	16.8	15.8	17.7	25.4	20.7	13.2	31.6	23.2	10.8	38.4	25.8	7.9
	85	40	22.8	22.3	23.7	35.0	29.1	17.9	43.9	33.1	14.9	54.7	37.9	11.1
		42	21.6	21.6	22.5	33.0	28.1	17.0	41.4	31.9	14.1	51.3	36.2	10.4
		45	19.7	19.7	20.6	30.1	26.7	15.5	37.6	30.1	12.8	46.1	33.8	9.4
		48	17.8	17.8	18.8	27.1	25.2	14.0	33.6	28.3	11.5	40.9	31.5	8.4
	90	40	24.5	24.5	25.4	37.5	34.1	19.2	47.1	38.9	16.0	58.7	44.5	11.9
		42	23.2	23.2	24.1	35.4	33.0	18.2	44.4	37.5	15.1	55.0	42.6	11.2
		45	21.2	21.2	22.1	32.3	31.4	16.6	40.3	35.4	13.7	49.5	39.8	10.1
		48	19.1	19.1	20.1	29.1	29.1	15.0	36.1	33.3	12.3	43.8	37.0	8.9
70	75	40	23.3	12.3	24.2	35.6	16.1	18.3	44.8	18.3	15.2	55.7	21.0	11.3
		42	22.0	12.0	22.9	33.6	15.6	17.3	42.2	17.7	14.4	52.3	20.1	10.6
		45	20.1	11.3	21.0	30.7	14.8	15.8	38.3	16.7	13.1	47.0	18.7	9.6
		48	18.2	10.7	19.1	27.6	14.0	14.3	34.3	15.7	11.7	41.6	17.4	8.5
	80	40	23.9	16.6	24.8	36.6	21.6	18.7	46.0	24.6	15.6	57.2	28.2	11.6
		42	22.6	16.1	23.5	34.6	20.9	17.7	43.3	23.7	14.7	53.7	27.0	10.9
		45	20.7	15.2	21.6	31.5	19.9	16.2	39.3	22.4	13.4	48.3	25.2	9.8
		48	18.7	14.3	19.6	28.3	18.8	14.6	35.2	21.1	12.0	42.8	23.4	8.7
	85	40	24.9	20.8	25.9	38.2	27.1	19.5	48.0	30.8	16.3	59.7	35.3	12.1
		42	23.6	20.1	24.5	36.1	26.2	18.5	45.2	29.7	15.4	56.0	33.8	11.4
		45	21.6	19.1	22.5	32.9	24.9	16.9	41.0	28.0	14.0	50.4	31.5	10.3
		48	19.5	17.9	20.4	29.6	23.5	15.2	36.7	26.4	12.5	44.6	29.3	9.1
	90	40	26.3	24.9	27.2	40.2	32.4	20.6	50.6	36.9	17.2	63.0	42.3	12.8
		42	24.9	24.1	25.8	38.0	31.4	19.5	47.7	35.6	16.2	59.1	40.5	12.0
		45	22.7	22.7	23.6	34.6	29.8	17.8	43.2	33.6	14.7	53.1	37.8	10.8
		48	20.5	20.5	21.5	31.2	28.1	16.0	38.7	31.6	13.2	47.0	35.1	9.6

Table 20. VUV 100, cooling coil H, 3-row / 16 fpi

Entering Wet Bulb Temp (°F)	Entering Dry Bulb Temp (°F)	Entering Water Temp (°F)	Flow Rate (gpm) 2 Total Capacity (MBh)	2 Sensible Capacity (MBh)	2 ΔT (°F)	4 Total Capacity (MBh)	4 Sensible Capacity (MBh)	4 ΔT (°F)	6 Total Capacity (MBh)	6 Sensible Capacity (MBh)	6 ΔT (°F)	10 Total Capacity (MBh)	10 Sensible Capacity (MBh)	10 ΔT (°F)
61	70	40	14.0	12.3	14.9	21.6	16.1	11.3	27.0	18.2	9.3	32.8	20.6	6.7
		42	13.2	11.9	14.1	20.4	15.5	10.7	25.4	17.5	8.8	30.7	19.7	6.3
		45	12.1	11.3	13.1	18.6	14.7	9.8	23.0	16.5	8.0	27.5	18.4	5.7
		48	11.0	10.7	11.9	16.8	13.9	8.9	20.6	15.6	7.2	24.2	17.1	5.0
	75	40	15.2	15.2	16.1	23.6	20.8	12.3	29.5	23.6	10.1	35.8	26.7	7.3
		42	14.4	14.4	15.3	22.3	20.1	11.6	27.7	22.7	9.6	33.5	25.5	6.9
		45	13.2	13.2	14.2	20.3	19.1	10.6	25.1	21.4	8.7	30.0	23.8	6.2
		48	12.0	12.0	12.9	18.3	18.1	9.6	22.5	20.2	7.8	26.4	22.1	5.5
	80	40	16.9	16.9	17.8	26.2	25.2	13.5	32.7	28.5	11.2	39.7	32.3	8.1
		42	16.0	16.0	16.9	24.7	24.4	12.8	30.8	27.5	10.6	37.1	30.9	7.6
		45	14.7	14.7	15.6	22.6	22.6	11.7	27.9	25.9	9.6	33.3	28.8	6.8
		48	13.4	13.4	14.3	20.3	20.3	10.6	24.9	24.4	8.6	29.3	26.8	6.0
	85	40	18.9	18.9	19.8	29.2	29.2	15.1	36.5	33.2	12.5	44.3	37.6	9.0
		42	17.9	17.9	18.8	27.6	27.6	14.3	34.3	32.0	11.7	41.4	36.0	8.5
		45	16.4	16.4	17.3	25.2	25.2	13.0	31.1	30.2	10.7	37.1	33.6	7.6
		48	14.9	14.9	15.8	22.7	22.7	11.8	27.8	27.8	9.6	32.7	31.2	6.7
	90	40	21.0	21.0	21.9	32.6	32.6	16.7	40.6	37.6	13.9	49.4	42.6	10.1
		42	19.9	19.9	20.8	30.8	30.8	15.8	38.3	36.2	13.1	46.2	40.8	9.4
		45	18.3	18.3	19.2	28.1	28.1	14.5	34.7	34.2	11.9	41.4	38.0	8.5
		48	16.6	16.6	17.5	25.3	25.3	13.1	31.0	31.0	10.6	36.4	35.3	7.5
67	75	40	19.1	13.3	20.0	29.5	17.3	15.2	36.9	19.6	12.6	44.8	22.2	9.1
		42	18.1	12.8	19.0	27.9	16.7	14.4	34.7	18.9	11.9	41.9	21.2	8.6
		45	16.6	12.2	17.5	25.4	15.9	13.2	31.4	17.8	10.8	37.5	19.8	7.7
		48	15.1	11.5	16.0	22.9	15.0	11.9	28.1	16.7	9.7	33.0	18.4	6.8
	80	40	20.0	17.2	20.9	31.0	22.4	15.9	38.7	25.3	13.2	47.0	28.7	9.6
		42	19.0	16.6	19.9	29.3	21.6	15.1	36.4	24.4	12.4	43.9	27.5	9.0
		45	17.4	15.8	18.3	26.7	20.5	13.8	33.0	23.0	11.3	39.4	25.6	8.1
		48	15.8	14.8	16.7	24.1	19.4	12.5	29.5	21.7	10.1	34.7	23.8	7.1
	85	40	21.3	20.9	22.2	33.0	27.3	16.9	41.2	30.9	14.0	50.0	35.0	10.2
		42	20.2	20.2	21.1	31.2	26.4	16.0	38.8	29.8	13.2	46.8	33.5	9.5
		45	18.5	18.5	19.4	28.4	25.1	14.7	35.1	28.1	12.0	41.9	31.3	8.6
		48	16.8	16.8	17.7	25.6	23.7	13.3	31.4	26.4	10.8	36.9	29.1	7.6
	90	40	22.8	22.8	23.7	35.4	32.1	18.1	44.2	36.3	15.0	53.6	41.2	10.9
		42	21.7	21.7	22.6	33.4	31.0	17.2	41.6	35.0	14.2	50.2	39.4	10.2
		45	19.9	19.9	20.8	30.5	29.5	15.7	37.7	33.1	12.9	45.0	36.7	9.2
		48	18.1	18.1	19.0	27.5	27.5	14.2	33.7	31.1	11.5	39.6	34.2	8.1
70	75	40	21.7	11.6	22.6	33.6	15.1	17.3	42.0	17.1	14.3	50.9	19.4	10.4
		42	20.6	11.2	21.5	31.8	14.6	16.3	39.5	16.5	13.5	47.7	18.6	9.7
		45	18.9	10.7	19.8	29.0	13.9	14.9	35.8	15.6	12.2	42.7	17.3	8.7
		48	17.1	10.0	18.1	26.1	13.1	13.5	32.0	14.7	11.0	37.6	16.1	7.7
	80	40	22.3	15.6	23.2	34.5	20.3	17.7	43.1	23.0	14.7	52.3	26.1	10.6
		42	21.1	15.1	22.0	32.6	19.7	16.8	40.6	22.2	13.8	49.0	24.9	10.0
		45	19.4	14.3	20.3	29.7	18.7	15.3	36.8	20.9	12.6	43.9	23.3	9.0
		48	17.6	13.5	18.5	26.8	17.6	13.9	32.9	19.7	11.3	38.6	21.6	7.9
	85	40	23.3	19.5	24.2	36.0	25.5	18.5	45.0	28.8	15.3	54.6	32.7	11.1
		42	22.0	18.9	23.0	34.0	24.6	17.5	42.4	27.8	14.4	51.1	31.2	10.4
		45	20.2	17.9	21.1	31.0	23.4	16.0	38.4	26.2	13.1	45.8	29.1	9.3
		48	18.4	16.9	19.3	28.0	22.1	14.4	34.3	24.6	11.7	40.3	27.1	8.2
	90	40	24.5	23.4	25.4	38.0	30.5	19.4	47.4	34.5	16.1	57.6	39.1	11.7
		42	23.2	22.6	24.1	35.9	29.5	18.4	44.6	33.3	15.2	53.9	37.4	11.0
		45	21.3	21.3	22.2	32.7	28.0	16.8	40.4	31.4	13.8	48.2	34.9	9.8
		48	19.4	19.4	20.3	29.5	26.4	15.2	36.2	29.5	12.4	42.5	32.4	8.7

Table 21. VUV 100, cooling coil J (DX)

Size	EWB	Suct Temp	EDB = 70°F				EDB = 75°F				EDB = 80°F				EDB = 85°F			
			TC	SC	LDB	LWB	TC	SC	LDB	LWB	TC	SC	LDB	LWB	TC	SC	LDB	LWB
1000	61	40	29.1	19.1	52.1	50.5	31.8	25.3	51.3	49.3	35.2	31.0	51.0	47.9	39.4	36.3	51.0	46.0
		45	24.4	17.4	53.7	52.3	26.7	23.0	53.5	51.4	29.5	28.1	53.7	50.2	33.0	33.0	54.1	48.7
		50	19.7	15.6	55.4	54.1	21.5	20.7	55.6	53.4	23.8	23.8	57.7	52.5	26.6	26.6	60.1	51.3
	64	40	34.6	16.5	54.6	52.1	36.4	23.2	53.3	51.4	38.7	29.5	52.4	50.4	41.6	35.5	51.8	49.1
		45	29.0	15.0	56.0	54.2	30.5	21.1	55.2	53.6	32.5	26.8	54.9	52.8	34.9	32.2	54.9	51.8
		50	23.4	13.5	57.4	56.3	24.6	19.0	57.2	55.8	26.2	24.1	57.4	55.2	28.2	28.2	58.6	54.4
	67	40	40.9	13.2	57.6	53.7	42.2	20.3	56.0	53.1	43.7	27.1	54.6	52.5	45.7	33.5	53.6	51.6
		45	34.3	12.0	58.8	56.1	35.4	18.5	57.7	55.6	36.7	24.6	57.0	55.1	38.3	30.5	56.4	54.4
		50	27.7	10.8	59.9	58.4	28.5	16.6	59.5	58.1	29.6	22.2	59.2	57.6	30.9	27.4	59.3	57.1
	70	40					48.9	16.8	59.3	54.8	50.0	23.8	57.7	54.3	51.3	30.6	56.4	53.7
		45					41.0	15.2	60.8	57.6	41.9	21.6	59.8	57.2	43.0	27.8	59.0	56.7
		50					33.1	13.7	62.2	60.2	33.8	19.5	61.7	60.0	34.7	25.0	61.6	59.6
	73	40									57.2	19.9	61.4	56.0	58.1	26.9	59.8	55.6
		45									47.9	18.1	63.1	59.2	48.7	24.4	62.2	58.9
		50									38.7	16.2	64.8	62.2	39.3	22.0	64.4	61.9

EDB = Entering Air Temperature, Dry Bulb (°F)
EWB = Entering Air Temperature, Wet Bulb (°F)
TC = Total Capacity (MBh)
SC = Sensible Capacity (MBh)
LDB = Leaving Air Temperature, Dry Bulb (°F)
LWB = Leaving Air Temperature, Wet Bulb (°F)

Table 22. Airflow correction (% of design airflow)

%	Total Capacity (MBh)	Sensible Capacity (MBh)
120	1.025	1.105
110	1.012	1.051
100	1.000	0.998
90	0.987	0.945
80	0.974	0.892

Table 23. Airflow through coil J

Unit Model	1000
Rated cfm	989

Table 24. VUV 100, hydronic heating coils A (1-row / 12 fpi), B (2-row / 12 fpi), C (2-row / 16 fpi)

			Flow Rate (gpm)					
			2		4		6	
Coil	Entering Air Temp, Dry Bulb (°F)	Entering Water Temp (°F)	Total Capacity (MBh)	Waterside Temp Drop (°F)	Total Capacity (MBh)	Waterside Temp Drop (°F)	Total Capacity (MBh)	Waterside Temp Drop (°F)
A	50	120	23.8	22.9	28.4	13.7	30.4	9.8
		140	33.3	32.4	39.7	19.4	42.5	13.9
		160	42.9	42.0	51.2	25.1	54.7	17.9
		180	52.6	51.7	62.6	30.8	66.9	22.0
	55	120	22.5	21.6	26.8	12.9	28.7	9.3
		140	31.5	30.6	37.6	18.3	40.2	13.1
		160	40.6	39.7	48.4	23.7	51.7	16.9
		180	49.7	48.8	59.2	29.1	63.3	20.8
	60	120	21.2	20.3	25.3	12.2	27.1	8.7
		140	29.7	28.8	35.5	17.3	37.9	12.3
		160	38.3	37.4	45.6	22.3	48.8	16.0
		180	46.9	46.0	55.9	27.5	59.7	19.6
	65	120	20.0	19.1	23.8	11.4	25.5	8.2
		140	27.9	27.0	33.3	16.2	35.6	11.6
		160	36.0	35.1	42.9	21.0	45.9	15.0
		180	44.1	43.2	52.5	25.8	56.1	18.4
	70	120	18.7	17.8	22.3	10.7	23.8	7.6
		140	26.1	25.2	31.2	15.1	33.4	10.8
		160	33.7	32.8	40.2	19.6	42.9	14.0
		180	41.3	40.4	49.2	24.1	52.5	17.2
B	50	120	32.6	31.7	43.1	21.1	47.6	15.6
		140	46.2	45.3	60.7	29.9	66.9	22.0
		160	59.8	58.9	78.3	38.7	86.4	28.5
		180	73.3	72.4	96.0	47.5	105.9	35.0
	55	120	30.8	29.9	40.8	19.9	45.1	14.7
		140	43.7	42.8	57.4	28.2	63.3	20.8
		160	56.6	55.7	74.1	36.6	81.7	26.9
		180	69.3	68.4	90.8	44.9	100.1	33.1
	60	120	29.1	28.2	38.5	18.8	42.5	13.9
		140	41.3	40.4	54.2	26.6	59.7	19.6
		160	53.4	52.5	69.9	34.5	77.1	25.4
		180	65.4	64.5	85.6	42.3	94.5	31.2
	65	120	27.3	26.4	36.2	17.6	40.0	13.0
		140	38.8	37.9	50.9	25.0	56.2	18.4
		160	50.2	49.3	65.7	32.4	72.5	23.9
		180	61.5	60.6	80.5	39.8	88.8	29.3
	70	120	25.6	24.7	33.9	16.5	37.4	12.2
		140	36.3	35.4	47.6	23.3	52.6	17.2
		160	47.0	46.1	61.5	30.3	67.8	22.3
		180	57.5	56.6	75.3	37.2	83.1	27.4
C	50	120	33.7	32.8	45.4	22.2	50.2	16.4
		140	47.9	47.0	63.8	31.4	70.6	23.2
		160	62.0	61.1	82.4	40.7	91.0	30.0
		180	75.9	75.0	100.9	50.0	111.6	36.9
	55	120	31.9	31.0	42.9	21.0	47.5	15.5
		140	45.3	44.4	60.4	29.7	66.8	22.0
		160	58.6	57.7	77.9	38.5	86.1	28.4
		180	71.8	70.9	95.4	47.2	105.5	34.9
	60	120	30.1	29.2	40.5	19.8	44.8	14.6
		140	42.7	41.8	57.0	28.0	63.0	20.7
		160	55.3	54.4	73.5	36.3	81.2	26.8
		180	67.8	66.9	90.0	44.5	99.5	32.9
	65	120	28.3	27.4	38.1	18.6	42.1	13.7
		140	40.1	39.2	53.5	26.3	59.2	19.4
		160	52.0	51.1	69.1	34.1	76.4	25.2
		180	63.7	62.8	84.6	41.8	93.6	30.9
	70	120	26.5	25.6	35.6	17.3	39.4	12.8
		140	37.6	36.7	50.1	24.6	55.4	18.2
		160	48.6	47.7	64.7	31.9	71.5	23.5
		180	59.6	58.7	79.2	39.1	87.6	28.9

Table 25. VUV 100, steam heating coils K (low-capacity), L (high-capacity)

			Steam Pressure (psig)					
			5		10		15	
Size	Coil	Entering Air Temp, Dry Bulb (°F)	Total Capacity (MBh)	Airside Temp Rise (°F)	Total Capacity (MBh)	Airside Temp Rise (°F)	Total Capacity (MBh)	Airside Temp Rise (°F)
1000	K	0	92.9	86.0	97.7	90.5	101.8	94.3
		10	88.8	82.2	93.6	86.7	97.7	90.5
		20	84.7	78.4	89.5	82.9	93.6	86.7
		30	80.6	74.6	85.4	79.1	89.5	82.9
		40	76.5	70.8	81.3	75.3	85.4	79.1
		50	72.4	67.0	77.2	71.5	81.3	75.3
		60	68.3	63.3	73.1	67.7	77.3	71.5
		70	64.3	59.5	69.1	64.0	73.2	67.8
	L	0	131.0	121.3	137.8	127.6	143.6	132.9
		10	125.3	116.0	132.0	122.3	137.8	127.6
		20	119.5	110.6	126.3	116.9	132.0	122.3
		30	113.7	105.3	120.5	111.6	126.3	116.9
		40	107.9	99.9	114.7	106.2	120.5	111.6
		50	102.2	94.6	108.9	100.9	114.7	106.2
		60	96.4	89.3	103.2	95.6	109.0	100.9
		70	90.7	84.0	97.4	90.2	103.2	95.6

psig = steam pressure (lb/in.^{2} gage)

Table 26. VUV 125, cooling coil D, 3-row / 12 fpi

Entering Wet Bulb Temp (°F)	Entering Dry Bulb Temp (°F)	Entering Water Temp (°F)	Flow Rate (gpm) 6 Total Capacity (MBh)	6 Sensible Capacity (MBh)	6 ΔT (°F)	8 Total Capacity (MBh)	8 Sensible Capacity (MBh)	8 ΔT (°F)	10 Total Capacity (MBh)	10 Sensible Capacity (MBh)	10 ΔT (°F)	14 Total Capacity (MBh)	14 Sensible Capacity (MBh)	14 ΔT (°F)
61	70	40	27.5	19.8	9.5	31.6	21.2	8.2	34.4	22.3	7.1	38.0	23.8	5.6
		42	26.0	19.2	9.1	29.8	20.6	7.7	32.4	21.5	6.7	35.8	22.9	5.3
		45	23.8	18.4	8.3	27.1	19.6	7.1	29.4	20.4	6.1	32.4	21.5	4.8
		48	21.5	17.6	7.5	24.4	18.7	6.4	26.4	19.3	5.5	28.9	20.1	4.3
	75	40	30.0	25.6	10.4	34.5	27.5	8.9	37.5	28.9	7.7	41.4	30.9	6.1
		42	28.4	24.9	9.8	32.5	26.7	8.4	35.4	27.9	7.3	39.0	29.6	5.7
		45	26.0	23.9	9.0	29.6	25.4	7.7	32.1	26.5	6.6	35.3	27.8	5.2
		48	23.5	22.8	8.2	26.6	24.2	6.9	28.8	25.1	6.0	31.5	26.0	4.7
	80	40	33.3	31.0	11.5	38.2	33.3	9.8	41.6	34.9	8.5	45.9	37.4	6.7
		42	31.5	30.2	10.9	36.1	32.3	9.3	39.3	33.8	8.1	43.3	35.9	6.3
		45	28.8	28.8	10.0	32.8	30.8	8.5	35.6	32.0	7.3	39.2	33.7	5.8
		48	26.0	26.0	9.0	29.5	29.3	7.7	31.9	30.3	6.6	35.0	31.5	5.2
	85	40	37.1	36.1	12.7	42.7	38.7	10.9	46.5	40.7	9.5	51.3	43.5	7.5
		42	35.2	35.1	12.1	40.3	37.5	10.3	43.8	39.3	9.0	48.3	41.7	7.1
		45	32.1	32.1	11.1	36.6	35.8	9.4	39.8	37.3	8.2	43.7	39.2	6.4
		48	29.0	29.0	10.1	32.9	32.9	8.5	35.6	35.3	7.3	39.0	36.7	5.7
	90	40	41.4	40.9	14.2	47.6	43.9	12.2	51.8	46.1	10.6	57.2	49.3	8.3
		42	39.2	39.2	13.4	44.9	42.5	11.5	48.8	44.5	10.0	53.8	47.3	7.8
		45	35.8	35.8	12.3	40.9	40.6	10.5	44.3	42.2	9.1	48.7	44.4	7.1
		48	32.4	32.4	11.2	36.7	36.7	9.5	39.7	39.7	8.2	43.5	41.6	6.4
67	75	40	37.5	21.3	12.9	43.1	22.8	11.1	47.0	24.0	9.6	51.8	25.6	7.6
		42	35.5	20.7	12.2	40.7	22.1	10.5	44.3	23.2	9.1	48.8	24.6	7.1
		45	32.5	19.8	11.2	37.0	21.1	9.5	40.2	22.0	8.3	44.2	23.1	6.5
		48	29.4	18.9	10.2	33.3	20.1	8.6	36.0	20.8	7.4	39.5	21.6	5.8
	80	40	39.4	27.5	13.5	45.2	29.6	11.6	49.3	31.0	10.1	54.4	33.2	7.9
		42	37.3	26.8	12.8	42.7	28.7	11.0	46.5	30.0	9.5	51.2	31.8	7.5
		45	34.1	25.7	11.7	38.9	27.3	10.0	42.2	28.5	8.7	46.3	29.9	6.8
		48	30.8	24.5	10.6	34.9	26.0	9.0	37.8	27.0	7.8	41.4	28.0	6.1
	85	40	41.9	33.6	14.3	48.2	36.1	12.3	52.5	37.9	10.7	57.9	40.5	8.4
		42	39.7	32.7	13.6	45.5	35.0	11.6	49.5	36.6	10.1	54.5	38.9	7.9
		45	36.3	31.3	12.5	41.4	33.4	10.6	44.9	34.7	9.2	49.3	36.5	7.2
		48	32.8	29.9	11.3	37.2	31.8	9.6	40.2	32.9	8.3	44.1	34.2	6.5
	90	40	45.0	39.5	15.4	51.7	42.4	13.2	56.3	44.5	11.5	62.1	47.6	9.0
		42	42.6	38.4	14.6	48.8	41.1	12.5	53.1	43.0	10.8	58.5	45.7	8.5
		45	38.9	36.8	13.3	44.4	39.2	11.4	48.2	40.8	9.9	52.9	42.9	7.7
		48	35.2	35.2	12.1	39.9	37.3	10.2	43.1	38.7	8.8	47.3	40.2	6.9
70	75	40	42.7	18.6	14.6	49.1	20.0	12.5	53.5	21.0	10.9	59.0	22.4	8.6
		42	40.5	18.1	13.9	46.3	19.4	11.9	50.4	20.3	10.3	55.5	21.5	8.1
		45	37.0	17.4	12.7	42.2	18.5	10.8	45.7	19.2	9.4	50.3	20.2	7.3
		48	33.4	16.6	11.5	37.9	17.6	9.7	41.0	18.2	8.4	44.9	18.9	6.6
	80	40	43.9	25.0	15.0	50.4	26.8	12.9	54.9	28.2	11.2	60.6	30.1	8.8
		42	41.6	24.3	14.2	47.6	26.0	12.2	51.8	27.2	10.6	57.0	28.9	8.3
		45	38.0	23.3	13.0	43.3	24.8	11.1	47.0	25.8	9.6	51.6	27.1	7.5
		48	34.3	22.3	11.8	38.9	23.6	10.0	42.1	24.5	8.6	46.1	25.4	6.7
	85	40	45.8	31.3	15.6	52.6	33.6	13.4	57.3	35.3	11.7	63.2	37.8	9.2
		42	43.4	30.5	14.8	49.7	32.6	12.7	54.0	34.1	11.0	59.5	36.2	8.7
		45	39.6	29.2	13.6	45.2	31.1	11.6	49.0	32.4	10.0	53.9	34.0	7.9
		48	35.8	27.9	12.3	40.6	29.6	10.4	43.9	30.7	9.0	48.1	31.8	7.0
	90	40	48.3	37.5	16.5	55.5	40.3	14.1	60.4	42.3	12.3	66.7	45.2	9.7
		42	45.7	36.5	15.6	52.4	39.0	13.4	56.9	40.9	11.6	62.8	43.4	9.1
		45	41.8	35.0	14.3	47.6	37.2	12.2	51.7	38.8	10.6	56.8	40.7	8.3
		48	37.8	33.4	13.0	42.8	35.5	11.0	46.3	36.7	9.5	50.7	38.1	7.4

Table 27. VUV 125, cooling coil E, 3-row / 16 fpi

Entering Wet Bulb Temp (°F)	Entering Dry Bulb Temp (°F)	Entering Water Temp (°F)	Flow Rate (gpm) 6 Total Capacity (MBh)	6 Sensible Capacity (MBh)	6 ΔT (°F)	8 Total Capacity (MBh)	8 Sensible Capacity (MBh)	8 ΔT (°F)	10 Total Capacity (MBh)	10 Sensible Capacity (MBh)	10 ΔT (°F)	14 Total Capacity (MBh)	14 Sensible Capacity (MBh)	14 ΔT (°F)
61	70	40	28.5	19.6	9.9	32.7	21.3	8.4	35.5	22.4	7.3	39.0	23.9	5.7
		42	27.0	19.1	9.4	30.9	20.6	8.0	33.5	21.6	6.9	36.8	23.0	5.4
		45	24.8	18.3	8.6	28.2	19.5	7.3	30.5	20.4	6.3	33.4	21.5	4.9
		48	22.4	17.4	7.8	25.4	18.4	6.6	27.4	19.2	5.7	29.9	20.1	4.4
	75	40	31.1	25.5	10.7	35.6	27.6	9.2	38.7	29.1	8.0	42.6	31.0	6.2
		42	29.5	24.7	10.2	33.7	26.7	8.7	36.5	28.0	7.5	40.1	29.8	5.9
		45	27.0	23.6	9.4	30.7	25.3	8.0	33.2	26.4	6.9	36.4	27.9	5.4
		48	24.5	22.5	8.5	27.7	23.9	7.2	29.8	24.8	6.2	32.6	26.1	4.8
	80	40	34.5	30.8	11.9	39.5	33.4	10.2	42.9	35.2	8.8	47.2	37.5	6.9
		42	32.7	29.9	11.3	37.4	32.3	9.6	40.5	33.9	8.3	44.5	36.0	6.5
		45	30.0	28.6	10.4	34.1	30.6	8.8	36.9	32.0	7.6	40.4	33.8	5.9
		48	27.1	27.1	9.4	30.7	28.9	7.9	33.1	30.1	6.8	36.1	31.6	5.3
	85	40	38.5	35.9	13.2	44.1	38.8	11.3	47.9	40.9	9.8	52.7	43.7	7.7
		42	36.5	34.8	12.5	41.7	37.5	10.7	45.2	39.4	9.3	49.7	41.9	7.3
		45	33.4	33.3	11.5	38.0	35.6	9.8	41.1	37.2	8.4	45.0	39.3	6.6
		48	30.3	30.3	10.5	34.2	33.6	8.8	36.9	35.0	7.6	40.3	36.7	5.9
	90	40	42.9	40.6	14.7	49.2	44.0	12.6	53.4	46.4	10.9	58.7	49.5	8.5
		42	40.7	39.5	13.9	46.5	42.5	11.9	50.4	44.7	10.3	55.3	47.5	8.1
		45	37.3	37.3	12.8	42.4	40.3	10.9	45.8	42.2	9.4	50.2	44.5	7.3
		48	33.7	33.7	11.6	38.2	38.1	9.8	41.2	39.6	8.5	45.0	41.6	6.6
67	75	40	38.9	21.1	13.3	44.6	22.9	11.4	48.4	24.1	9.9	53.2	25.8	7.8
		42	36.9	20.5	12.7	42.1	22.1	10.8	45.7	23.3	9.4	50.2	24.7	7.3
		45	33.8	19.6	11.6	38.4	21.0	9.9	41.6	22.0	8.5	45.5	23.2	6.7
		48	30.6	18.7	10.6	34.6	19.8	8.9	37.3	20.6	7.7	40.8	21.7	6.0
	80	40	40.8	27.4	14.0	46.8	29.7	12.0	50.8	31.3	10.4	55.9	33.3	8.1
		42	38.7	26.6	13.3	44.2	28.7	11.3	48.0	30.1	9.8	52.7	32.0	7.7
		45	35.5	25.4	12.2	40.3	27.2	10.4	43.6	28.4	8.9	47.8	30.0	7.0
		48	32.1	24.2	11.1	36.3	25.7	9.4	39.2	26.7	8.1	42.8	28.0	6.3
	85	40	43.5	33.4	14.9	49.8	36.2	12.7	54.1	38.2	11.0	59.5	40.7	8.7
		42	41.2	32.5	14.1	47.1	35.0	12.0	51.1	36.8	10.4	56.1	39.1	8.2
		45	37.8	31.0	13.0	42.9	33.2	11.0	46.4	34.7	9.5	50.9	36.6	7.4
		48	34.2	29.5	11.8	38.7	31.3	9.9	41.7	32.6	8.6	45.5	34.2	6.7
	90	40	46.7	39.3	15.9	53.4	42.5	13.6	58.0	44.8	11.8	63.8	47.8	9.3
		42	44.2	38.2	15.1	50.5	41.1	12.9	54.8	43.2	11.2	60.1	45.9	8.8
		45	40.5	36.5	13.9	46.1	39.0	11.8	49.8	40.8	10.2	54.6	43.1	8.0
		48	36.7	34.7	12.6	41.5	36.8	10.6	44.7	38.3	9.2	48.8	40.2	7.1
70	75	40	44.3	18.5	15.1	50.7	20.1	13.0	55.1	21.1	11.2	60.6	22.5	8.8
		42	42.0	18.0	14.4	48.0	19.4	12.3	52.0	20.4	10.6	57.1	21.6	8.3
		45	38.5	17.2	13.2	43.7	18.4	11.2	47.3	19.2	9.7	51.8	20.3	7.6
		48	34.8	16.4	12.0	39.4	17.4	10.1	42.5	18.1	8.7	46.4	19.0	6.8
	80	40	45.5	24.9	15.5	52.1	26.9	13.3	56.6	28.4	11.5	62.3	30.3	9.1
		42	43.1	24.2	14.8	49.3	26.0	12.6	53.4	27.3	10.9	58.7	29.1	8.5
		45	39.5	23.1	13.5	44.9	24.7	11.5	48.6	25.8	9.9	53.2	27.3	7.8
		48	35.8	22.0	12.3	40.5	23.3	10.4	43.6	24.2	8.9	47.7	25.5	7.0
	85	40	47.5	31.1	16.2	54.4	33.7	13.9	59.1	35.6	12.0	65.0	37.9	9.4
		42	45.0	30.3	15.4	51.4	32.6	13.1	55.8	34.3	11.4	61.2	36.4	8.9
		45	41.2	28.9	14.1	46.9	30.9	12.0	50.7	32.3	10.4	55.5	34.1	8.1
		48	37.3	27.5	12.8	42.2	29.2	10.8	45.5	30.4	9.3	49.7	31.9	7.3
	90	40	50.1	37.3	17.1	57.3	40.4	14.6	62.3	42.6	12.7	68.5	45.4	9.9
		42	47.5	36.2	16.2	54.2	39.0	13.8	58.8	41.0	12.0	64.5	43.6	9.4
		45	43.5	34.6	14.9	49.4	37.0	12.6	53.5	38.7	10.9	58.5	40.9	8.5
		48	39.4	33.0	13.5	44.5	35.0	11.4	48.0	36.4	9.8	52.4	38.2	7.6

Table 28. VUV 125, cooling coil F, 4-row / 12 fpi

Entering Wet Bulb Temp (°F)	Entering Dry Bulb Temp (°F)	Entering Water Temp (°F)	Flow Rate (gpm) 6 Total Capacity (MBh)	6 Sensible Capacity (MBh)	6 ΔT (°F)	8 Total Capacity (MBh)	8 Sensible Capacity (MBh)	8 ΔT (°F)	10 Total Capacity (MBh)	10 Sensible Capacity (MBh)	10 ΔT (°F)	14 Total Capacity (MBh)	14 Sensible Capacity (MBh)	14 ΔT (°F)
61	70	40	26.4	19.5	9.2	31.3	21.4	8.1	34.9	22.9	7.2	39.7	25.1	5.8
		42	24.9	18.9	8.7	29.4	20.7	7.6	32.8	22.1	6.8	37.4	24.1	5.5
		45	22.6	18.0	7.9	26.6	19.6	6.9	29.7	20.8	6.2	33.8	22.5	5.0
		48	20.3	17.0	7.1	23.8	18.5	6.2	26.4	19.6	5.5	30.1	20.9	4.5
	75	40	28.7	25.2	10.0	34.1	27.7	8.8	38.1	29.7	7.8	43.3	32.6	6.4
		42	27.1	24.4	9.4	32.1	26.8	8.3	35.8	28.6	7.4	40.8	31.2	6.0
		45	24.6	23.3	8.6	29.0	25.4	7.5	32.4	27.0	6.7	36.8	29.1	5.4
		48	22.1	22.1	7.7	25.9	24.0	6.8	28.8	25.3	6.0	32.8	27.1	4.8
	80	40	31.9	30.5	11.0	37.8	33.6	9.7	42.2	35.9	8.7	48.1	39.4	7.0
		42	30.1	29.6	10.4	35.6	32.4	9.2	39.7	34.6	8.2	45.2	37.8	6.6
		45	27.3	27.3	9.5	32.2	30.8	8.3	35.9	32.7	7.4	40.8	35.3	6.0
		48	24.5	24.5	8.5	28.7	28.7	7.5	32.0	30.7	6.6	36.4	32.8	5.4
	85	40	35.6	35.5	12.2	42.2	39.0	10.8	47.1	41.8	9.6	53.6	45.9	7.8
		42	33.6	33.6	11.6	39.7	37.7	10.2	44.3	40.3	9.1	50.4	43.9	7.4
		45	30.5	30.5	10.5	35.9	35.8	9.3	40.0	38.0	8.2	45.6	41.0	6.7
		48	27.3	27.3	9.5	32.1	32.1	8.3	35.7	35.7	7.4	40.6	38.2	6.0
	90	40	39.7	39.7	13.6	47.0	44.2	12.0	52.5	47.4	10.7	59.8	52.0	8.7
		42	37.4	37.4	12.8	44.3	42.7	11.3	49.4	45.6	10.1	56.2	49.8	8.2
		45	34.0	34.0	11.7	40.1	40.1	10.3	44.6	43.0	9.1	50.8	46.5	7.4
		48	30.5	30.5	10.5	35.7	35.7	9.2	39.8	39.8	8.2	45.3	43.2	6.6
67	75	40	36.0	20.9	12.4	42.7	23.0	10.9	47.6	24.7	9.7	54.2	27.1	7.9
		42	33.9	20.3	11.7	40.2	22.3	10.3	44.8	23.8	9.2	51.0	25.9	7.4
		45	30.8	19.3	10.6	36.3	21.1	9.4	40.5	22.4	8.3	46.1	24.2	6.7
		48	27.6	18.3	9.6	32.4	19.9	8.4	36.1	21.1	7.4	41.0	22.5	6.0
	80	40	37.7	27.1	12.9	44.8	29.8	11.5	50.0	31.9	10.2	56.9	35.0	8.3
		42	35.6	26.3	12.2	42.1	28.8	10.8	47.0	30.7	9.6	53.5	33.5	7.8
		45	32.3	25.0	11.2	38.1	27.3	9.8	42.5	29.0	8.7	48.3	31.3	7.1
		48	29.0	23.7	10.0	34.0	25.8	8.8	37.8	27.3	7.8	43.0	29.1	6.3
	85	40	40.2	33.1	13.8	47.7	36.4	12.2	53.2	39.0	10.9	60.6	42.8	8.8
		42	37.9	32.1	13.0	44.9	35.2	11.5	50.0	37.5	10.2	57.0	40.9	8.3
		45	34.4	30.5	11.8	40.6	33.3	10.4	45.2	35.4	9.3	51.5	38.2	7.5
		48	30.9	29.0	10.7	36.2	31.5	9.3	40.3	33.3	8.3	45.8	35.6	6.7
	90	40	43.1	38.9	14.7	51.1	42.7	13.1	57.1	45.8	11.6	65.0	50.3	9.4
		42	40.7	37.7	13.9	48.1	41.3	12.3	53.7	44.1	11.0	61.1	48.1	8.9
		45	36.9	35.9	12.7	43.5	39.2	11.2	48.5	41.6	9.9	55.2	44.9	8.0
		48	33.1	33.1	11.4	38.8	37.0	10.0	43.2	39.1	8.9	49.2	41.8	7.2
70	75	40	40.9	18.3	14.0	48.6	20.1	12.4	54.2	21.6	11.1	61.7	23.7	9.0
		42	38.6	17.8	13.2	45.7	19.5	11.7	51.0	20.8	10.4	58.0	22.7	8.4
		45	35.1	16.9	12.1	41.4	18.5	10.6	46.1	19.6	9.4	52.4	21.2	7.6
		48	31.5	16.0	10.9	36.9	17.4	9.5	41.0	18.4	8.4	46.7	19.7	6.8
	80	40	42.0	24.6	14.4	49.9	27.1	12.7	55.7	29.0	11.4	63.4	31.8	9.2
		42	39.7	23.9	13.6	46.9	26.2	12.0	52.4	27.9	10.7	59.6	30.5	8.7
		45	36.0	22.7	12.4	42.5	24.8	10.9	47.3	26.3	9.7	53.9	28.4	7.9
		48	32.3	21.5	11.1	37.9	23.4	9.8	42.2	24.8	8.7	48.0	26.5	7.0
	85	40	43.9	30.8	15.0	52.0	33.9	13.3	58.1	36.3	11.8	66.2	39.9	9.6
		42	41.4	29.9	14.2	49.0	32.8	12.5	54.6	35.0	11.2	62.2	38.1	9.0
		45	37.6	28.5	12.9	44.3	31.1	11.4	49.4	33.0	10.1	56.2	35.6	8.2
		48	33.7	27.0	11.6	39.5	29.3	10.2	44.0	31.0	9.0	50.1	33.1	7.3
	90	40	46.3	36.9	15.8	54.9	40.6	14.0	61.2	43.5	12.5	69.7	47.7	10.1
		42	43.6	35.8	14.9	51.6	39.2	13.2	57.6	41.9	11.7	65.6	45.7	9.5
		45	39.6	34.1	13.6	46.7	37.2	12.0	52.1	39.5	10.6	59.2	42.7	8.6
		48	35.5	32.3	12.2	41.7	35.1	10.7	46.4	37.1	9.5	52.8	39.7	7.7

Table 29. VUV 125, cooling coil G, 4-row / 16 fpi

Entering Wet Bulb Temp (°F)	Entering Dry Bulb Temp (°F)	Entering Water Temp (°F)	Flow Rate (gpm) 6 Total Capacity (MBh)	6 Sensible Capacity (MBh)	6 ΔT (°F)	8 Total Capacity (MBh)	8 Sensible Capacity (MBh)	8 ΔT (°F)	10 Total Capacity (MBh)	10 Sensible Capacity (MBh)	10 ΔT (°F)	14 Total Capacity (MBh)	14 Sensible Capacity (MBh)	14 ΔT (°F)
61	70	40	27.2	19.8	9.4	32.3	21.8	8.4	36.1	23.4	7.4	41.1	25.7	6.0
		42	25.7	19.2	8.9	30.5	21.1	7.9	34.0	22.5	7.0	38.7	24.6	5.7
		45	23.4	18.3	8.2	27.6	20.0	7.2	30.7	21.2	6.4	35.0	22.9	5.2
		48	21.0	17.3	7.4	24.6	18.8	6.4	27.4	19.9	5.7	31.2	21.3	4.6
	75	40	29.7	25.6	10.3	35.3	28.2	9.1	39.4	30.3	8.1	44.8	33.3	6.6
		42	28.0	24.9	9.7	33.2	27.3	8.6	37.1	29.2	7.6	42.2	31.9	6.2
		45	25.5	23.7	8.9	30.1	25.9	7.8	33.5	27.5	6.9	38.2	29.7	5.6
		48	22.9	22.4	8.0	26.9	24.4	7.0	29.9	25.8	6.2	34.0	27.6	5.0
	80	40	32.9	31.0	11.4	39.1	34.2	10.1	43.7	36.7	9.0	49.7	40.3	7.3
		42	31.1	30.1	10.7	36.8	33.0	9.5	41.1	35.3	8.4	46.8	38.6	6.8
		45	28.3	28.3	9.8	33.4	31.3	8.6	37.2	33.3	7.7	42.3	36.0	6.2
		48	25.4	25.4	8.8	29.8	29.6	7.7	33.2	31.2	6.9	37.7	33.4	5.5
	85	40	36.8	36.1	12.6	43.7	39.8	11.2	48.7	42.7	10.0	55.5	46.9	8.1
		42	34.7	34.7	11.9	41.1	38.4	10.6	45.9	41.1	9.4	52.2	44.9	7.6
		45	31.6	31.6	10.9	37.2	36.4	9.6	41.5	38.7	8.5	47.2	41.8	6.9
		48	28.3	28.3	9.8	33.3	33.3	8.6	37.0	36.3	7.6	42.1	38.9	6.2
	90	40	41.0	40.9	14.0	48.7	45.1	12.4	54.3	48.3	11.1	61.9	53.2	9.0
		42	38.7	38.7	13.3	45.8	43.5	11.7	51.1	46.5	10.4	58.2	50.8	8.5
		45	35.2	35.2	12.1	41.5	41.3	10.7	46.3	43.9	9.5	52.6	47.4	7.7
		48	31.6	31.6	10.9	37.1	37.1	9.5	41.2	41.2	8.5	46.9	44.0	6.9
67	75	40	37.2	21.3	12.8	44.1	23.5	11.3	49.3	25.2	10.1	56.1	27.7	8.2
		42	35.1	20.7	12.1	41.6	22.7	10.7	46.4	24.2	9.5	52.8	26.5	7.7
		45	31.9	19.7	11.0	37.6	21.5	9.7	41.9	22.8	8.6	47.7	24.7	7.0
		48	28.6	18.6	9.9	33.6	20.3	8.7	37.4	21.4	7.7	42.5	22.9	6.2
	80	40	39.0	27.6	13.4	46.3	30.4	11.9	51.7	32.6	10.6	58.9	35.8	8.6
		42	36.8	26.7	12.6	43.6	29.3	11.2	48.6	31.4	10.0	55.4	34.2	8.1
		45	33.5	25.5	11.5	39.5	27.8	10.2	44.0	29.5	9.0	50.1	31.9	7.3
		48	30.0	24.1	10.4	35.3	26.2	9.1	39.2	27.7	8.1	44.6	29.7	6.5
	85	40	41.5	33.7	14.2	49.3	37.1	12.6	55.0	39.8	11.2	62.7	43.7	9.1
		42	39.2	32.6	13.4	46.4	35.8	11.9	51.8	38.3	10.6	59.0	41.8	8.6
		45	35.6	31.1	12.2	42.0	33.9	10.8	46.8	36.1	9.6	53.3	39.0	7.8
		48	32.0	29.5	11.0	37.5	32.0	9.7	41.8	33.9	8.6	47.5	36.2	6.9
	90	40	44.5	39.5	15.2	52.9	43.6	13.5	59.0	46.7	12.0	67.2	51.4	9.8
		42	42.0	38.4	14.4	49.8	42.1	12.7	55.6	45.0	11.3	63.3	49.1	9.2
		45	38.2	36.5	13.1	45.1	39.9	11.6	50.3	42.4	10.3	57.2	45.8	8.3
		48	34.3	34.3	11.8	40.3	37.6	10.3	44.8	39.8	9.2	51.0	42.6	7.4
70	75	40	42.3	18.6	14.5	50.2	20.5	12.8	56.1	22.0	11.4	63.8	24.2	9.3
		42	39.9	18.1	13.7	47.3	19.8	12.1	52.8	21.2	10.8	60.1	23.2	8.7
		45	36.3	17.2	12.5	42.8	18.8	11.0	47.7	20.0	9.8	54.3	21.6	7.9
		48	32.6	16.3	11.2	38.3	17.7	9.8	42.6	18.8	8.7	48.4	20.1	7.1
	80	40	43.4	25.0	14.9	51.6	27.6	13.2	57.6	29.6	11.7	65.6	32.5	9.5
		42	41.0	24.3	14.0	48.6	26.7	12.4	54.2	28.5	11.1	61.7	31.1	9.0
		45	37.3	23.1	12.8	44.0	25.3	11.3	49.0	26.8	10.0	55.8	29.0	8.1
		48	33.5	21.9	11.5	39.3	23.8	10.1	43.7	25.2	9.0	49.7	26.9	7.3
	85	40	45.3	31.4	15.5	53.8	34.5	13.7	60.1	37.0	12.2	68.4	40.7	9.9
		42	42.8	30.4	14.6	50.7	33.4	13.0	56.6	35.7	11.5	64.4	39.0	9.4
		45	38.9	29.0	13.3	45.9	31.6	11.8	51.2	33.6	10.5	58.2	36.3	8.5
		48	34.9	27.4	12.0	41.0	29.9	10.5	45.6	31.6	9.3	51.9	33.7	7.6
	90	40	47.8	37.6	16.3	56.7	41.4	14.5	63.3	44.4	12.9	72.1	48.8	10.5
		42	45.1	36.4	15.4	53.5	40.0	13.6	59.6	42.7	12.1	67.9	46.7	9.9
		45	41.0	34.7	14.0	48.4	37.9	12.4	53.9	40.3	11.0	61.4	43.5	8.9
		48	36.8	32.9	12.6	43.2	35.8	11.1	48.1	37.8	9.8	54.7	40.4	8.0

Table 30. VUV 125, cooling coil H, 3-row / 16 fpi

Entering Wet Bulb Temp (°F)	Entering Dry Bulb Temp (°F)	Entering Water Temp (°F)	Flow Rate (gpm) 6 Total Capacity (MBh)	6 Sensible Capacity (MBh)	6 ΔT (°F)	8 Total Capacity (MBh)	8 Sensible Capacity (MBh)	8 ΔT (°F)	10 Total Capacity (MBh)	10 Sensible Capacity (MBh)	10 ΔT (°F)	14 Total Capacity (MBh)	14 Sensible Capacity (MBh)	14 ΔT (°F)
61	70	40	30.5	21.0	10.5	34.7	22.8	9.0	37.6	24.0	7.7	41.2	25.6	6.0
		42	28.7	20.2	9.9	32.6	21.8	8.4	35.2	23.0	7.3	38.6	24.4	5.7
		45	26.0	19.1	9.0	29.3	20.5	7.6	31.6	21.4	6.5	34.6	22.7	5.1
		48	23.2	17.9	8.1	26.0	19.1	6.8	27.9	19.9	5.8	30.5	20.9	4.5
	75	40	33.3	27.2	11.5	37.9	29.5	9.7	41.0	31.1	8.4	45.0	33.2	6.6
		42	31.3	26.2	10.8	35.5	28.3	9.2	38.4	29.8	7.9	42.1	31.6	6.2
		45	28.3	24.7	9.8	32.0	26.5	8.3	34.5	27.8	7.1	37.7	29.4	5.5
		48	25.2	23.2	8.8	28.3	24.7	7.4	30.5	25.8	6.3	33.2	27.1	4.9
	80	40	36.9	32.9	12.7	42.0	35.7	10.8	45.5	37.7	9.3	49.9	40.2	7.3
		42	34.7	31.7	12.0	39.4	34.3	10.1	42.6	36.0	8.7	46.7	38.3	6.8
		45	31.4	29.9	10.8	35.5	32.1	9.1	38.2	33.6	7.9	41.8	35.5	6.1
		48	28.0	28.0	9.7	31.4	29.9	8.1	33.8	31.2	7.0	36.9	32.8	5.4
	85	40	41.2	38.3	14.1	46.9	41.6	12.0	50.7	43.8	10.4	55.6	46.7	8.1
		42	38.8	36.9	13.3	44.0	39.9	11.3	47.5	41.9	9.7	52.1	44.5	7.6
		45	35.1	34.8	12.1	39.6	37.3	10.2	42.7	39.1	8.8	46.6	41.3	6.8
		48	31.3	31.3	10.8	35.1	34.8	9.0	37.7	36.3	7.8	41.1	38.2	6.0
	90	40	45.9	43.4	15.7	52.2	47.1	13.3	56.6	49.7	11.5	62.0	52.9	9.0
		42	43.2	41.8	14.8	49.0	45.2	12.5	53.0	47.5	10.8	58.0	50.5	8.5
		45	39.1	39.1	13.4	44.1	42.3	11.3	47.6	44.3	9.7	52.0	46.8	7.6
		48	34.8	34.8	12.0	39.1	39.1	10.0	42.0	41.1	8.6	45.8	43.3	6.7
67	75	40	41.7	22.6	14.3	47.4	24.5	12.1	51.3	25.8	10.5	56.2	27.6	8.2
		42	39.2	21.8	13.4	44.4	23.5	11.4	48.1	24.7	9.8	52.6	26.3	7.7
		45	35.4	20.5	12.2	40.0	22.0	10.3	43.1	23.1	8.8	47.1	24.4	6.9
		48	31.6	19.3	10.9	35.4	20.5	9.1	38.1	21.4	7.8	41.6	22.5	6.1
	80	40	43.7	29.2	14.9	49.7	31.7	12.7	53.8	33.5	11.0	59.0	35.7	8.6
		42	41.1	28.2	14.1	46.6	30.4	11.9	50.4	32.0	10.3	55.2	34.0	8.0
		45	37.2	26.6	12.8	42.0	28.5	10.8	45.3	29.8	9.3	49.5	31.6	7.2
		48	33.1	25.0	11.4	37.2	26.6	9.6	40.0	27.7	8.2	43.6	29.2	6.4
	85	40	46.5	35.7	15.9	52.9	38.7	13.5	57.3	40.8	11.7	62.8	43.5	9.1
		42	43.8	34.4	15.0	49.6	37.1	12.7	53.7	39.1	11.0	58.8	41.5	8.6
		45	39.6	32.4	13.6	44.7	34.8	11.4	48.2	36.4	9.9	52.7	38.5	7.7
		48	35.3	30.5	12.1	39.6	32.5	10.2	42.6	33.8	8.7	46.4	35.6	6.8
	90	40	49.9	41.9	17.0	56.8	45.5	14.5	61.5	48.0	12.5	67.4	51.2	9.8
		42	47.0	40.4	16.0	53.3	43.6	13.6	57.6	45.9	11.7	63.1	48.8	9.2
		45	42.5	38.1	14.5	47.9	40.9	12.3	51.7	42.8	10.6	56.5	45.3	8.2
		48	37.9	35.8	13.0	42.5	38.1	10.9	45.7	39.8	9.4	49.8	41.8	7.3
70	75	40	47.4	19.8	16.2	53.9	21.5	13.8	58.4	22.6	11.9	64.0	24.1	9.3
		42	44.6	19.0	15.2	50.6	20.6	12.9	54.7	21.6	11.2	59.9	23.0	8.7
		45	40.3	18.0	13.8	45.5	19.3	11.7	49.1	20.2	10.0	53.7	21.3	7.8
		48	36.0	16.9	12.4	40.3	18.0	10.4	43.4	18.7	8.9	47.3	19.7	6.9
	80	40	48.7	26.5	16.6	55.4	28.8	14.1	60.0	30.4	12.2	65.8	32.4	9.6
		42	45.8	25.6	15.6	52.0	27.6	13.3	56.2	29.1	11.5	61.5	30.9	8.9
		45	41.4	24.1	14.2	46.8	25.9	12.0	50.4	27.1	10.3	55.1	28.7	8.0
		48	36.9	22.7	12.7	41.4	24.2	10.6	44.6	25.2	9.1	48.6	26.5	7.1
	85	40	50.8	33.2	17.3	57.8	36.1	14.7	62.6	38.1	12.7	68.6	40.6	10.0
		42	47.8	32.0	16.3	54.2	34.6	13.8	58.6	36.4	11.9	64.2	38.7	9.3
		45	43.2	30.2	14.8	48.8	32.4	12.5	52.6	33.9	10.7	57.5	35.9	8.4
		48	38.5	28.4	13.2	43.2	30.2	11.1	46.5	31.5	9.5	50.7	33.2	7.4
	90	40	53.6	39.8	18.2	60.9	43.2	15.5	66.0	45.6	13.4	72.3	48.6	10.5
		42	50.4	38.4	17.2	57.2	41.5	14.6	61.8	43.6	12.6	67.7	46.3	9.8
		45	45.6	36.2	15.6	51.4	38.8	13.1	55.5	40.7	11.3	60.6	43.0	8.8
		48	40.6	34.0	13.9	45.6	36.2	11.7	49.0	37.8	10.0	53.5	39.7	7.8

Table 31. VUV 125, cooling coil J (DX)

Size	EWB	Suct Temp	EDB = 70°F				EDB = 75°F				EDB = 80°F				EDB = 85°F			
			TC	SC	LDB	LWB	TC	SC	LDB	LWB	TC	SC	LDB	LWB	TC	SC	LDB	LWB
1250	61	40	35.1	23.4	52.7	51.0	38.4	30.9	52.2	49.9	42.5	37.8	52.1	48.5	47.5	44.3	52.3	46.8
		45	29.4	21.2	54.3	52.8	32.2	28.1	54.2	51.9	35.6	34.4	54.6	50.8	39.8	39.8	55.6	49.4
		50	23.7	19.1	55.9	54.5	25.9	25.3	56.3	53.8	28.7	28.7	58.8	52.9	32.1	32.1	61.3	51.8
	64	40	41.7	20.2	55.1	52.8	43.9	28.4	54.0	52.0	46.7	36.1	53.3	51.1	50.2	43.4	52.9	49.9
		45	34.9	18.3	56.5	54.8	36.8	25.8	55.9	54.2	39.1	32.8	55.8	53.4	42.1	39.4	55.9	52.5
		50	28.2	16.5	57.8	56.7	29.7	23.2	57.9	56.2	31.6	29.5	58.2	55.6	34.0	34.0	59.9	54.9
	67	40	49.3	16.2	58.0	54.4	50.9	24.9	56.6	53.9	52.8	33.1	55.5	53.3	55.1	41.0	54.7	52.5
		45	41.3	14.7	59.1	56.7	42.7	22.6	58.3	56.2	44.2	30.1	57.8	55.8	46.2	37.2	57.5	55.1
		50	33.3	13.2	60.2	58.9	34.4	20.3	60.0	58.5	35.7	27.1	60.0	58.1	37.3	33.5	60.2	57.6
	70	40					59.0	20.5	59.9	55.6	60.3	29.1	58.5	55.2	61.9	37.4	57.4	54.6
		45					49.4	18.6	61.3	58.3	50.5	26.4	60.5	57.9	51.9	34.0	59.9	57.5
		50					39.9	16.8	62.6	60.8	40.8	23.8	62.4	60.5	41.9	30.6	62.4	60.1
	73	40									68.9	24.3	62.0	57.0	70.1	32.8	60.8	56.6
		45									57.8	22.1	63.7	60.0	58.7	29.8	63.0	59.7
		50									46.6	19.9	65.3	62.8	47.4	26.9	65.1	62.5

EDB = Entering Air Temperature, Dry Bulb (°F)
EWB = Entering Air Temperature, Wet Bulb (°F)
TC = Total Capacity (MBh)
SC = Sensible Capacity (MBh)
LDB = Leaving Air Temperature, Dry Bulb (°F)
LWB = Leaving Air Temperature, Wet Bulb (°F)

Table 32. Airflow correction (% of design airflow)

%	Total Capacity (MBh)	Sensible Capacity (MBh)
120	1.025	1.105
110	1.012	1.051
100	1.000	0.998
90	0.987	0.945
80	0.974	0.892

Table 33. Airflow through coil J

Unit Model	1250
Rated CFM	1253

Table 34. VUV 125, hydronic heating coils A (1-row / 12 fpi), B (2-row / 12 fpi), C (2-row/ 16 fpi)

			Flow Rate (gpm)					
			2		4		6	
Coil	Entering Air Temp, Dry Bulb (°F)	Entering Water Temp (°F)	Total Capacity (MBh)	Waterside Temp Drop (°F)	Total Capacity (MBh)	Waterside Temp Drop (°F)	Total Capacity (MBh)	Waterside Temp Drop (°F)
A	50	120	29.4	28.3	36.3	17.6	39.4	12.8
		140	41.1	40.0	50.8	24.8	55.1	18.0
		160	52.8	51.7	65.3	32.1	70.9	23.3
		180	64.7	63.6	80.0	39.4	86.7	28.5
	55	120	27.8	26.7	34.3	16.6	37.2	12.0
		140	38.8	37.7	48.0	23.4	52.1	17.0
		160	50.0	48.9	61.8	30.3	67.0	22.0
		180	61.2	60.1	75.7	37.3	82.0	27.0
	60	120	26.2	25.1	32.4	15.6	35.1	11.3
		140	36.6	35.5	45.3	22.1	49.1	16.0
		160	47.2	46.1	58.3	28.6	63.2	20.7
		180	57.7	56.6	71.4	35.1	77.4	25.4
	65	120	24.6	23.5	30.4	14.6	33.0	10.6
		140	34.4	33.3	42.6	20.7	46.2	15.0
		160	44.3	43.2	54.8	26.8	59.4	19.4
		180	54.3	53.2	67.1	33.0	72.7	23.9
	70	120	23.1	22.0	28.5	13.7	30.9	9.9
		140	32.2	31.1	39.9	19.4	43.2	14.0
		160	41.5	40.4	51.3	25.1	55.6	18.2
		180	50.8	49.7	62.8	30.8	68.1	22.3
B	50	120	34.8	33.7	46.1	22.5	51.1	16.7
		140	49.2	48.1	64.8	31.8	71.8	23.6
		160	63.4	62.3	83.5	41.2	92.5	30.5
		180	77.6	76.5	102.2	50.5	113.3	37.4
	55	120	33.0	31.9	43.6	21.2	48.4	15.8
		140	46.5	45.4	61.3	30.1	67.9	22.3
		160	60.0	58.9	79.0	38.9	87.5	28.8
		180	73.4	72.3	96.7	47.8	107.2	35.4
	60	120	31.1	30.0	41.1	20.0	45.6	14.8
		140	43.9	42.8	57.8	28.3	64.0	21.0
		160	56.6	55.5	74.5	36.7	82.5	27.1
		180	69.2	68.1	91.2	45.0	101.1	33.3
	65	120	29.2	28.1	38.7	18.8	42.9	13.9
		140	41.3	40.2	54.3	26.6	60.2	19.7
		160	53.2	52.1	70.0	34.4	77.6	25.5
		180	65.1	64.0	85.8	42.3	95.0	31.3
	70	120	27.4	26.3	36.2	17.5	40.1	13.0
		140	38.6	37.5	50.8	24.8	56.3	18.4
		160	49.8	48.7	65.6	32.2	72.6	23.8
		180	60.9	59.8	80.3	39.6	88.9	29.3
C	50	120	36.9	35.8	50.3	24.6	56.3	18.4
		140	52.1	51.0	70.7	34.8	79.1	26.0
		160	67.2	66.1	91.1	45.0	102.0	33.6
		180	82.2	81.1	111.6	55.2	124.9	41.3
	55	120	34.9	33.8	47.6	23.2	53.3	17.4
		140	49.2	48.1	66.9	32.9	74.8	24.6
		160	63.6	62.5	86.2	42.5	96.5	31.8
		180	77.7	76.6	105.6	52.2	118.2	39.0
	60	120	32.9	31.8	44.9	21.9	50.2	16.4
		140	46.5	45.4	63.1	31.0	70.6	23.2
		160	60.0	58.9	81.3	40.1	91.0	30.0
		180	73.3	72.2	99.6	49.2	111.5	36.8
	65	120	30.9	29.8	42.2	20.5	47.2	15.4
		140	43.7	42.6	59.3	29.1	66.3	21.7
		160	56.4	55.3	76.5	37.7	85.6	28.2
		180	69.0	67.9	93.6	46.2	104.8	34.6
	70	120	28.9	27.8	39.5	19.2	44.2	14.4
		140	40.9	39.8	55.5	27.2	62.1	20.3
		160	52.7	51.6	71.5	35.2	80.1	26.3
		180	64.5	63.4	87.6	43.2	98.1	32.3

Table 35. VUV 125, steam heating coils K (low-capacity), L (high-capacity)

			Steam Pressure (psig)					
			5		10		15	
Size	Coil	Entering Air Temp, Dry Bulb (°F)	Total Capacity (MBh)	Airside Temp Rise (°F)	Total Capacity (MBh)	Airside Temp Rise (°F)	Total Capacity (MBh)	Airside Temp Rise (°F)
1250	K	0	116.9	86.6	123.0	91.1	128.1	94.9
		10	111.8	82.7	117.8	87.2	122.9	91.1
		20	106.6	79.0	112.7	83.5	117.8	87.3
		30	101.6	75.2	107.6	79.7	112.8	83.6
		40	96.5	71.5	102.5	76.0	107.7	79.8
		50	91.3	67.6	97.4	72.1	102.5	76.0
		60	86.1	63.7	92.1	68.2	97.3	72.1
		70	81.0	60.0	87.0	64.5	92.2	68.3
	L	0	138.1	102.3	145.3	107.6	151.4	112.1
		10	132.1	97.8	139.2	103.1	145.3	107.6
		20	126.0	93.3	133.1	98.6	139.2	103.1
		30	119.9	88.8	127.0	94.1	133.2	98.6
		40	113.8	84.3	121.0	89.6	127.1	94.1
		50	107.7	79.8	114.9	85.1	121.0	89.7
		60	101.7	75.3	108.8	80.6	115.0	85.2
		70	95.6	70.8	102.8	76.1	108.9	80.7

psig = steam pressure ($lb/in.^2$ gage)

Table 36. VUV 150, cooling coil D, 3-row / 12 fpi

Entering Wet Bulb Temp (°F)	Entering Dry Bulb Temp (°F)	Entering Water Temp (°F)	Flow Rate (gpm) 6 Total Capacity (MBh)	6 Sensible Capacity (MBh)	6 ΔT (°F)	8 Total Capacity (MBh)	8 Sensible Capacity (MBh)	8 ΔT (°F)	10 Total Capacity (MBh)	10 Sensible Capacity (MBh)	10 ΔT (°F)	14 Total Capacity (MBh)	14 Sensible Capacity (MBh)	14 ΔT (°F)
61	70	40	30.9	23.0	10.7	36.5	25.3	9.4	41.0	27.0	8.4	46.9	29.3	6.9
		42	29.2	22.2	10.1	34.5	24.4	8.9	38.5	26.0	7.9	43.9	28.1	6.4
		45	26.6	21.1	9.3	31.3	23.1	8.1	34.9	24.5	7.2	39.4	26.3	5.8
		48	24.1	19.9	8.4	28.1	21.7	7.3	31.2	23.0	6.5	34.9	24.5	5.2
	75	40	33.7	29.8	11.6	39.9	32.7	10.3	44.7	34.9	9.2	51.1	38.0	7.5
		42	31.8	28.8	11.0	37.6	31.6	9.7	42.0	33.6	8.6	47.9	36.4	7.0
		45	29.0	27.3	10.1	34.1	29.9	8.8	38.0	31.7	7.8	43.0	34.0	6.3
		48	26.2	25.8	9.1	30.7	28.2	8.0	34.0	29.8	7.0	38.0	31.8	5.6
	80	40	37.3	36.0	12.8	44.2	39.6	11.3	49.5	42.3	10.1	56.7	46.0	8.3
		42	35.3	34.9	12.2	41.7	38.2	10.7	46.6	40.7	9.6	53.1	44.0	7.8
		45	32.2	32.2	11.1	37.9	36.2	9.8	42.2	38.4	8.7	47.7	41.2	7.0
		48	29.1	29.1	10.1	34.0	34.0	8.8	37.7	36.0	7.8	42.2	38.5	6.2
	85	40	41.7	41.7	14.3	49.3	46.1	12.6	55.3	49.2	11.3	63.3	53.5	9.2
		42	39.4	39.4	13.5	46.5	44.5	11.9	52.0	47.4	10.6	59.3	51.2	8.6
		45	35.9	35.9	12.4	42.3	42.1	10.9	47.1	44.6	9.7	53.2	48.0	7.8
		48	32.5	32.5	11.2	38.0	38.0	9.8	42.1	41.9	8.7	47.1	44.8	6.9
	90	40	46.5	46.5	15.9	55.0	52.2	14.0	61.6	55.7	12.6	70.5	60.6	10.2
		42	43.9	43.9	15.0	51.8	50.4	13.3	58.0	53.7	11.8	66.1	58.0	9.6
		45	40.1	40.1	13.8	47.1	47.1	12.1	52.5	50.6	10.7	59.3	54.3	8.6
		48	36.2	36.2	12.5	42.3	42.3	10.9	46.9	46.9	9.6	52.5	50.7	7.7
67	75	40	42.1	24.7	14.4	49.9	27.2	12.8	55.9	29.0	11.4	63.9	31.5	9.3
		42	39.8	23.9	13.7	47.0	26.2	12.0	52.6	27.9	10.8	59.9	30.2	8.7
		45	36.3	22.7	12.5	42.7	24.8	11.0	47.6	26.3	9.8	53.8	28.3	7.9
		48	32.8	21.5	11.3	38.4	23.4	9.9	42.5	24.7	8.7	47.6	26.4	7.0
	80	40	44.2	32.0	15.1	52.3	35.2	13.4	58.6	37.5	12.0	67.1	40.8	9.8
		42	41.8	31.0	14.3	49.3	34.0	12.6	55.2	36.1	11.3	62.9	39.1	9.2
		45	38.1	29.4	13.1	44.8	32.1	11.5	49.9	34.1	10.2	56.5	36.6	8.2
		48	34.5	27.8	11.9	40.3	30.3	10.4	44.6	32.0	9.2	49.9	34.2	7.3
	85	40	47.1	39.1	16.1	55.7	42.9	14.2	62.4	45.8	12.7	71.4	49.8	10.4
		42	44.5	37.8	15.2	52.5	41.5	13.4	58.7	44.1	12.0	66.9	47.7	9.7
		45	40.6	35.8	13.9	47.7	39.2	12.2	53.1	41.6	10.9	60.1	44.7	8.8
		48	36.7	33.9	12.6	42.9	37.0	11.0	47.5	39.1	9.7	53.2	41.7	7.8
	90	40	50.5	45.9	17.2	59.7	50.5	15.2	67.0	53.9	13.6	76.6	58.5	11.1
		42	47.7	44.4	16.3	56.3	48.7	14.4	63.0	51.9	12.8	71.8	56.1	10.4
		45	43.5	42.1	14.9	51.2	46.1	13.1	57.0	48.9	11.6	64.5	52.5	9.4
		48	39.4	39.4	13.5	46.0	43.4	11.8	51.0	45.9	10.4	57.0	49.0	8.3
70	75	40	48.0	21.6	16.4	56.7	23.8	14.5	63.6	25.4	13.0	72.8	27.6	10.6
		42	45.3	20.9	15.5	53.5	23.0	13.7	59.8	24.4	12.2	68.2	26.4	9.9
		45	41.3	19.9	14.2	48.6	21.7	12.5	54.1	23.0	11.1	61.2	24.8	8.9
		48	37.4	18.8	12.9	43.7	20.5	11.2	48.4	21.6	9.9	54.2	23.1	7.9
	80	40	49.3	29.1	16.8	58.3	32.0	14.9	65.3	34.1	13.3	74.8	37.1	10.9
		42	46.5	28.1	15.9	55.0	30.8	14.0	61.5	32.8	12.5	70.1	35.5	10.2
		45	42.5	26.7	14.6	49.9	29.2	12.8	55.6	30.9	11.4	62.9	33.2	9.2
		48	38.4	25.2	13.2	44.9	27.5	11.5	49.7	29.1	10.2	55.7	31.0	8.1
	85	40	51.4	36.4	17.5	60.8	40.0	15.5	68.2	42.7	13.9	78.0	46.4	11.3
		42	48.6	35.2	16.6	57.4	38.6	14.6	64.2	41.1	13.1	73.1	44.5	10.6
		45	44.3	33.4	15.2	52.1	36.5	13.3	58.0	38.7	11.8	65.7	41.6	9.5
		48	40.1	31.6	13.8	46.8	34.4	12.0	51.9	36.4	10.6	58.1	38.9	8.5
	90	40	54.2	43.6	18.5	64.1	47.9	16.3	71.9	51.2	14.6	82.2	55.6	11.9
		42	51.2	42.2	17.5	60.5	46.3	15.4	67.6	49.3	13.8	77.1	53.3	11.2
		45	46.7	40.0	16.0	54.9	43.8	14.0	61.2	46.4	12.5	69.2	49.9	10.1
		48	42.2	37.8	14.5	49.4	41.3	12.6	54.7	43.6	11.2	61.2	46.5	8.9

Table 37. VUV 150, cooling coil E, 3-row / 16 fpi

Entering Wet Bulb Temp (°F)	Entering Dry Bulb Temp (°F)	Entering Water Temp (°F)	Flow Rate (gpm) 6 Total Capacity (MBh)	6 Sensible Capacity (MBh)	6 ΔT (°F)	8 Total Capacity (MBh)	8 Sensible Capacity (MBh)	8 ΔT (°F)	10 Total Capacity (MBh)	10 Sensible Capacity (MBh)	10 ΔT (°F)	14 Total Capacity (MBh)	14 Sensible Capacity (MBh)	14 ΔT (°F)
61	70	40	31.8	23.1	11.0	37.7	25.4	9.7	42.2	27.2	8.7	48.2	29.5	7.1
		42	30.1	22.4	10.4	35.5	24.6	9.2	39.7	26.1	8.2	45.2	28.3	6.6
		45	27.4	21.2	9.5	32.3	23.2	8.4	36.0	24.6	7.4	40.6	26.4	6.0
		48	24.8	20.1	8.7	29.0	21.9	7.6	32.2	23.1	6.7	36.0	24.6	5.3
	75	40	34.7	30.0	12.0	41.1	33.0	10.6	46.0	35.2	9.4	52.6	38.3	7.7
		42	32.8	29.0	11.3	38.7	31.8	10.0	43.3	33.9	8.9	49.3	36.7	7.2
		45	29.9	27.5	10.4	35.2	30.1	9.1	39.2	31.9	8.1	44.3	34.3	6.5
		48	27.0	26.0	9.4	31.6	28.3	8.2	35.1	29.9	7.3	39.2	31.9	5.8
	80	40	38.5	36.3	13.2	45.5	39.9	11.7	51.0	42.6	10.4	58.3	46.4	8.5
		42	36.4	35.1	12.5	43.0	38.5	11.0	48.1	41.0	9.8	54.7	44.4	8.0
		45	33.2	33.2	11.5	39.1	36.4	10.1	43.5	38.6	8.9	49.2	41.5	7.2
		48	30.0	30.0	10.4	35.1	34.3	9.1	38.9	36.2	8.0	43.5	38.6	6.4
	85	40	42.9	42.2	14.7	50.8	46.4	13.0	57.0	49.6	11.6	65.1	53.9	9.5
		42	40.6	40.6	13.9	48.0	44.8	12.3	53.6	47.7	11.0	61.0	51.6	8.9
		45	37.0	37.0	12.7	43.6	42.4	11.2	48.6	44.9	9.9	54.9	48.3	8.0
		48	33.5	33.5	11.6	39.2	39.2	10.1	43.4	42.1	8.9	48.6	44.9	7.1
	90	40	47.9	47.8	16.3	56.7	52.6	14.5	63.5	56.1	12.9	72.6	61.1	10.5
		42	45.2	45.2	15.5	53.5	50.8	13.7	59.8	54.0	12.2	68.0	58.5	9.9
		45	41.3	41.3	14.2	48.6	48.0	12.4	54.1	50.9	11.1	61.2	54.7	8.9
		48	37.3	37.3	12.8	43.7	43.7	11.2	48.4	47.7	9.9	54.1	50.9	7.9
67	75	40	43.4	24.9	14.9	51.4	27.4	13.1	57.6	29.2	11.8	65.8	31.8	9.6
		42	41.0	24.1	14.1	48.5	26.4	12.4	54.2	28.1	11.1	61.7	30.5	9.0
		45	37.4	22.9	12.9	44.1	25.0	11.3	49.1	26.5	10.1	55.5	28.5	8.1
		48	33.8	21.6	11.7	39.6	23.5	10.2	43.9	24.8	9.0	49.1	26.5	7.2
	80	40	45.5	32.2	15.6	53.9	35.4	13.8	60.4	37.8	12.3	69.0	41.2	10.0
		42	43.0	31.2	14.7	50.8	34.2	13.0	56.9	36.4	11.6	64.7	39.4	9.4
		45	39.3	29.6	13.5	46.2	32.3	11.9	51.5	34.3	10.5	58.2	36.8	8.5
		48	35.5	28.0	12.2	41.5	30.4	10.7	46.0	32.2	9.4	51.5	34.3	7.5
	85	40	48.5	39.3	16.6	57.4	43.3	14.6	64.3	46.2	13.1	73.5	50.2	10.7
		42	45.8	38.1	15.7	54.1	41.7	13.8	60.5	44.4	12.3	68.9	48.1	10.0
		45	41.8	36.1	14.3	49.2	39.5	12.6	54.8	41.8	11.2	61.9	45.0	9.0
		48	37.8	34.1	13.0	44.2	37.2	11.4	49.0	39.3	10.0	54.8	41.9	8.0
	90	40	52.0	46.2	17.7	61.6	50.8	15.7	69.0	54.3	14.0	78.8	59.0	11.4
		42	49.2	44.7	16.8	58.1	49.1	14.8	65.0	52.2	13.2	73.9	56.6	10.7
		45	44.9	42.4	15.4	52.8	46.4	13.5	58.8	49.2	12.0	66.5	52.8	9.7
		48	40.5	40.1	13.9	47.5	43.7	12.2	52.6	46.1	10.8	58.8	49.2	8.6
70	75	40	49.4	21.8	16.9	58.5	24.0	14.9	65.5	25.6	13.3	74.9	27.8	10.9
		42	46.7	21.1	16.0	55.2	23.1	14.1	61.7	24.6	12.6	70.2	26.7	10.2
		45	42.6	20.0	14.6	50.1	21.9	12.8	55.9	23.2	11.4	63.1	24.9	9.2
		48	38.5	18.9	13.2	45.1	20.6	11.6	49.9	21.7	10.2	55.9	23.2	8.2
	80	40	50.7	29.3	17.3	60.1	32.2	15.3	67.3	34.4	13.7	76.9	37.4	11.2
		42	48.0	28.3	16.4	56.7	31.1	14.5	63.4	33.1	12.9	72.1	35.8	10.5
		45	43.8	26.9	15.0	51.5	29.4	13.2	57.4	31.1	11.7	64.8	33.5	9.4
		48	39.5	25.4	13.6	46.3	27.6	11.9	51.3	29.2	10.5	57.4	31.2	8.4
	85	40	52.9	36.6	18.0	62.7	40.3	16.0	70.2	43.0	14.3	80.3	46.8	11.6
		42	50.0	35.5	17.1	59.1	38.9	15.1	66.1	41.4	13.5	75.3	44.8	10.9
		45	45.7	33.6	15.6	53.8	36.8	13.7	59.9	39.0	12.2	67.7	41.9	9.8
		48	41.3	31.8	14.2	48.3	34.6	12.4	53.5	36.6	10.9	59.9	39.0	8.7
	90	40	55.8	43.9	19.0	66.1	48.3	16.8	74.0	51.5	15.0	84.6	56.1	12.3
		42	52.8	42.5	18.0	62.3	46.6	15.9	69.7	49.6	14.2	79.4	53.7	11.5
		45	48.1	40.3	16.4	56.7	44.0	14.5	63.1	46.7	12.9	71.3	50.2	10.4
		48	43.5	38.1	14.9	50.9	41.5	13.0	56.4	43.8	11.5	63.1	46.7	9.2

Table 38. VUV 150, cooling coil F, 4-row / 12 fpi

Entering Wet Bulb Temp (°F)	Entering Dry Bulb Temp (°F)	Entering Water Temp (°F)	Flow Rate (gpm) 6 Total Capacity (MBh)	6 Sensible Capacity (MBh)	6 ΔT (°F)	8 Total Capacity (MBh)	8 Sensible Capacity (MBh)	8 ΔT (°F)	10 Total Capacity (MBh)	10 Sensible Capacity (MBh)	10 ΔT (°F)	14 Total Capacity (MBh)	14 Sensible Capacity (MBh)	14 ΔT (°F)
61	70	40	32.8	23.5	11.3	39.0	25.9	10.0	44.0	27.7	9.0	51.2	30.4	7.5
		42	31.0	22.7	10.7	36.8	25.0	9.5	41.5	26.7	8.5	48.1	29.2	7.0
		45	28.3	21.6	9.8	33.5	23.6	8.7	37.6	25.2	7.8	43.4	27.3	6.4
		48	25.6	20.4	8.9	30.1	22.3	7.8	33.7	23.6	7.0	38.5	25.4	5.7
	75	40	35.8	30.4	12.3	42.5	33.5	10.9	48.0	35.9	9.8	55.9	39.4	8.2
		42	33.8	29.4	11.7	40.1	32.4	10.3	45.3	34.6	9.3	52.5	37.8	7.7
		45	30.9	28.0	10.7	36.5	30.6	9.4	41.0	32.6	8.4	47.3	35.4	6.9
		48	27.9	26.5	9.7	32.8	28.9	8.5	36.7	30.6	7.6	42.0	33.0	6.2
	80	40	39.7	36.8	13.6	47.2	40.6	12.1	53.2	43.4	10.9	62.0	47.7	9.0
		42	37.5	35.6	12.9	44.5	39.2	11.4	50.2	41.9	10.3	58.2	45.7	8.5
		45	34.3	33.9	11.8	40.5	37.1	10.4	45.5	39.5	9.3	52.5	42.8	7.7
		48	30.9	30.9	10.7	36.4	35.0	9.4	40.7	37.1	8.4	46.6	39.9	6.8
	85	40	44.3	42.8	15.2	52.6	47.2	13.5	59.4	50.5	12.1	69.2	55.5	10.1
		42	41.9	41.5	14.4	49.7	45.6	12.7	56.0	48.7	11.4	65.0	53.2	9.5
		45	38.2	38.2	13.1	45.2	43.1	11.6	50.8	45.9	10.4	58.6	49.8	8.5
		48	34.5	34.5	11.9	40.6	40.6	10.5	45.5	43.1	9.3	52.0	46.4	7.6
	90	40	49.4	48.5	16.9	58.7	53.4	15.0	66.2	57.3	13.5	77.1	62.9	11.2
		42	46.7	46.7	16.0	55.4	51.6	14.1	62.4	55.2	12.7	72.4	60.3	10.5
		45	42.6	42.6	14.6	50.4	48.9	12.9	56.6	52.0	11.6	65.3	56.4	9.5
		48	38.5	38.5	13.2	45.3	45.3	11.6	50.7	48.9	10.4	58.0	52.6	8.5
67	75	40	44.8	25.2	15.3	53.2	27.8	13.6	60.1	29.8	12.2	69.9	32.7	10.2
		42	42.3	24.4	14.5	50.2	26.9	12.9	56.6	28.7	11.6	65.7	31.4	9.6
		45	38.6	23.2	13.3	45.7	25.4	11.7	51.3	27.1	10.5	59.2	29.4	8.6
		48	34.9	22.0	12.0	41.1	24.0	10.6	46.0	25.4	9.4	52.6	27.4	7.7
	80	40	47.0	32.7	16.1	55.8	36.0	14.3	63.0	38.6	12.8	73.4	42.4	10.6
		42	44.4	31.6	15.2	52.7	34.8	13.5	59.4	37.2	12.1	68.9	40.6	10.0
		45	40.5	30.1	13.9	47.9	32.9	12.3	53.9	35.0	11.0	62.1	38.0	9.0
		48	36.6	28.5	12.6	43.1	31.1	11.1	48.2	32.9	9.9	55.2	35.4	8.1
	85	40	50.0	39.9	17.1	59.4	44.0	15.2	67.1	47.1	13.7	78.1	51.7	11.3
		42	47.3	38.6	16.2	56.1	42.5	14.3	63.2	45.4	12.9	73.4	49.6	10.7
		45	43.2	36.7	14.8	51.0	40.2	13.1	57.3	42.8	11.7	66.1	46.4	9.6
		48	38.9	34.8	13.4	45.9	37.9	11.8	51.3	40.2	10.5	58.7	43.3	8.6
	90	40	53.7	46.9	18.3	63.7	51.7	16.2	72.0	55.3	14.6	83.8	60.8	12.1
		42	50.7	45.4	17.3	60.2	49.9	15.3	67.8	53.3	13.8	78.7	58.3	11.4
		45	46.3	43.2	15.8	54.8	47.2	14.0	61.5	50.3	12.5	71.0	54.5	10.3
		48	41.8	40.9	14.3	49.2	44.6	12.6	55.1	47.2	11.3	63.0	50.8	9.2
70	75	40	51.0	22.1	17.4	60.5	24.4	15.4	68.4	26.1	13.9	79.6	28.6	11.5
		42	48.2	21.4	16.5	57.2	23.5	14.6	64.4	25.1	13.1	74.8	27.5	10.9
		45	44.0	20.3	15.1	52.0	22.3	13.3	58.4	23.7	11.9	67.4	25.7	9.8
		48	39.7	19.3	13.6	46.7	21.0	12.0	52.3	22.3	10.7	59.9	24.0	8.7
	80	40	52.3	29.7	17.8	62.2	32.7	15.8	70.2	35.0	14.3	81.7	38.5	11.8
		42	49.5	28.7	16.9	58.7	31.6	15.0	66.2	33.8	13.5	76.8	36.9	11.1
		45	45.2	27.3	15.5	53.4	29.9	13.7	60.0	31.8	12.2	69.2	34.5	10.1
		48	40.8	25.9	14.0	48.0	28.2	12.3	53.7	29.9	11.0	61.5	32.2	9.0
	85	40	54.6	37.2	18.6	64.9	41.0	16.5	73.3	43.9	14.9	85.3	48.2	12.4
		42	51.7	36.0	17.6	61.3	39.6	15.6	69.1	42.3	14.1	80.1	46.2	11.6
		45	47.1	34.2	16.1	55.7	37.5	14.2	62.6	39.9	12.8	72.3	43.2	10.5
		48	42.5	32.4	14.6	50.1	35.3	12.8	56.1	37.5	11.5	64.2	40.3	9.3
	90	40	57.6	44.5	19.6	68.4	49.1	17.4	77.2	52.6	15.7	89.9	57.7	13.0
		42	54.5	43.1	18.5	64.6	47.4	16.4	72.8	50.6	14.8	84.5	55.3	12.2
		45	49.7	41.0	17.0	58.8	44.9	15.0	66.0	47.8	13.4	76.2	51.8	11.1
		48	44.8	38.8	15.3	52.8	42.3	13.5	59.1	44.9	12.1	67.6	48.3	9.8

Table 39. VUV 150, cooling coil G, 4-row / 16 fpi

Entering Wet Bulb Temp (°F)	Entering Dry Bulb Temp (°F)	Entering Water Temp (°F)	Flow Rate (gpm) 6 Total Capacity (MBh)	6 Sensible Capacity (MBh)	6 ΔT (°F)	8 Total Capacity (MBh)	8 Sensible Capacity (MBh)	8 ΔT (°F)	10 Total Capacity (MBh)	10 Sensible Capacity (MBh)	10 ΔT (°F)	14 Total Capacity (MBh)	14 Sensible Capacity (MBh)	14 ΔT (°F)
61	70	40	33.6	24.0	11.6	40.1	26.5	10.3	45.5	28.5	9.3	53.1	31.4	7.8
		42	31.8	23.2	11.0	37.8	25.6	9.8	42.7	27.4	8.8	49.7	29.9	7.3
		45	29.2	22.2	10.1	34.5	24.3	8.9	38.8	25.8	8.0	44.8	28.0	6.6
		48	26.4	21.0	9.2	31.1	22.9	8.1	34.8	24.3	7.2	39.9	26.2	5.9
	75	40	36.7	31.1	12.6	43.8	34.4	11.2	49.6	36.9	10.2	58.0	40.6	8.4
		42	34.7	30.1	12.0	41.3	33.1	10.6	46.6	35.4	9.6	54.2	38.8	7.9
		45	31.9	28.7	11.0	37.7	31.5	9.7	42.3	33.5	8.7	48.8	36.3	7.1
		48	28.8	27.2	10.0	33.9	29.7	8.8	38.0	31.5	7.8	43.5	33.9	6.4
	80	40	40.7	37.6	14.0	48.6	41.6	12.4	55.0	44.7	11.2	64.3	49.2	9.4
		42	38.5	36.5	13.2	45.8	40.1	11.7	51.7	42.9	10.6	60.1	47.0	8.8
		45	35.3	34.8	12.2	41.8	38.1	10.7	47.0	40.5	9.6	54.2	44.0	7.9
		48	31.9	31.9	11.0	37.6	36.0	9.7	42.1	38.1	8.7	48.3	41.0	7.1
	85	40	45.4	43.8	15.5	54.2	48.4	13.8	61.4	52.0	12.5	71.7	57.2	10.4
		42	43.0	42.4	14.7	51.1	46.7	13.1	57.7	49.9	11.8	67.0	54.6	9.7
		45	39.4	39.4	13.5	46.6	44.3	12.0	52.4	47.2	10.7	60.5	51.1	8.8
		48	35.6	35.6	12.3	42.0	41.8	10.8	47.0	44.3	9.6	53.9	47.8	7.9
	90	40	50.6	49.6	17.3	60.4	54.8	15.4	68.4	58.9	13.9	80.0	64.8	11.6
		42	47.9	47.9	16.4	56.9	52.9	14.5	64.3	56.6	13.1	74.7	61.9	10.8
		45	44.0	44.0	15.1	52.0	50.2	13.3	58.4	53.4	11.9	67.4	57.9	9.8
		48	39.7	39.7	13.6	46.8	46.8	12.0	52.4	50.2	10.7	60.1	54.1	8.7
67	75	40	45.9	25.8	15.7	54.8	28.5	14.0	62.0	30.6	12.6	72.5	33.7	10.5
		42	43.4	25.0	14.9	51.6	27.5	13.2	58.3	29.4	11.9	67.8	32.2	9.8
		45	39.9	23.9	13.7	47.1	26.1	12.1	53.0	27.8	10.8	61.1	30.2	8.9
		48	36.0	22.6	12.4	42.4	24.7	10.9	47.5	26.2	9.7	54.4	28.2	7.9
	80	40	48.2	33.4	16.5	57.5	36.9	14.7	65.1	39.7	13.3	76.1	43.7	11.0
		42	45.6	32.4	15.6	54.2	35.6	13.8	61.1	38.1	12.5	71.1	41.7	10.3
		45	41.8	30.9	14.3	49.4	33.8	12.7	55.6	36.0	11.4	64.1	39.0	9.3
		48	37.7	29.3	13.0	44.5	31.9	11.4	49.9	33.9	10.2	57.1	36.5	8.3
	85	40	51.3	40.8	17.5	61.2	45.1	15.6	69.3	48.4	14.1	81.0	53.3	11.7
		42	48.5	39.5	16.6	57.7	43.5	14.7	65.1	46.5	13.3	75.7	50.9	11.0
		45	44.5	37.7	15.2	52.6	41.3	13.5	59.2	43.9	12.1	68.2	47.7	9.9
		48	40.2	35.7	13.8	47.4	39.0	12.1	53.1	41.3	10.9	60.8	44.5	8.9
	90	40	55.0	47.9	18.7	65.6	53.0	16.7	74.3	56.9	15.1	86.9	62.7	12.6
		42	52.0	46.5	17.7	61.9	51.1	15.8	69.8	54.7	14.2	81.2	59.8	11.8
		45	47.8	44.3	16.3	56.5	48.5	14.4	63.5	51.6	12.9	73.2	56.0	10.6
		48	43.1	42.0	14.8	50.8	45.8	13.0	56.9	48.6	11.6	65.3	52.3	9.5
70	75	40	52.2	22.6	17.8	62.3	25.0	15.9	70.6	26.8	14.4	82.5	29.5	12.0
		42	49.4	21.9	16.9	58.8	24.1	15.0	66.3	25.8	13.5	77.1	28.2	11.2
		45	45.4	20.9	15.5	53.6	22.9	13.7	60.3	24.3	12.3	69.5	26.4	10.1
		48	40.9	19.8	14.0	48.3	21.6	12.4	54.1	22.9	11.1	62.0	24.6	9.0
	80	40	53.7	30.4	18.3	64.0	33.6	16.3	72.5	36.0	14.7	84.8	39.7	12.3
		42	50.8	29.4	17.3	60.3	32.4	15.4	68.1	34.6	13.9	79.2	37.9	11.5
		45	46.6	28.1	15.9	55.1	30.7	14.1	61.9	32.7	12.6	71.4	35.5	10.4
		48	42.1	26.6	14.4	49.6	29.0	12.7	55.6	30.7	11.3	63.7	33.1	9.3
	85	40	56.0	38.0	19.1	66.8	42.0	17.0	75.7	45.1	15.4	88.5	49.7	12.8
		42	53.0	36.8	18.1	63.0	40.5	16.0	71.1	43.4	14.5	82.7	47.4	12.0
		45	48.6	35.1	16.6	57.5	38.5	14.7	64.6	40.9	13.2	74.5	44.4	10.8
		48	43.9	33.3	15.0	51.8	36.3	13.2	58.0	38.5	11.8	66.4	41.5	9.7
	90	40	59.0	45.5	20.1	70.5	50.3	17.9	79.8	54.0	16.2	93.2	59.5	13.5
		42	55.8	44.1	19.0	66.4	48.6	16.9	74.9	51.9	15.2	87.1	56.8	12.6
		45	51.3	42.1	17.5	60.6	46.1	15.5	68.1	49.0	13.9	78.6	53.2	11.4
		48	46.3	39.9	15.8	54.6	43.5	13.9	61.1	46.1	12.5	70.0	49.7	10.2

Table 40. VUV 150, cooling coil H, 3-row / 16 fpi, EarthWise

Entering Wet Bulb Temp (°F)	Entering Dry Bulb Temp (°F)	Entering Water Temp (°F)	Flow Rate (gpm) 6 Total Capacity (MBh)	6 Sensible Capacity (MBh)	6 ΔT (°F)	8 Total Capacity (MBh)	8 Sensible Capacity (MBh)	8 ΔT (°F)	10 Total Capacity (MBh)	10 Sensible Capacity (MBh)	10 ΔT (°F)	14 Total Capacity (MBh)	14 Sensible Capacity (MBh)	14 ΔT (°F)
61	70	40	35.4	23.7	12.2	41.3	25.7	10.6	45.5	27.2	9.3	50.5	29.2	7.4
		42	33.6	23.0	11.6	39.1	24.9	10.1	43.0	26.2	8.8	47.5	28.0	7.0
		45	30.9	21.9	10.7	35.8	23.6	9.2	39.2	24.8	8.1	43.0	26.2	6.3
		48	28.1	20.7	9.7	32.4	22.3	8.4	35.4	23.3	7.3	38.4	24.5	5.7
	75	40	38.7	30.8	13.3	45.0	33.4	11.5	49.6	35.2	10.2	55.1	37.8	8.0
		42	36.7	29.8	12.6	42.6	32.3	11.0	46.9	34.0	9.6	51.9	36.2	7.6
		45	33.7	28.4	11.6	39.0	30.6	10.1	42.8	32.1	8.8	46.9	34.0	6.9
		48	30.6	26.9	10.6	35.3	28.9	9.1	38.6	30.2	8.0	41.9	31.8	6.2
	80	40	42.9	37.3	14.7	49.9	40.4	12.8	55.0	42.7	11.2	61.1	45.7	8.9
		42	40.7	36.1	14.0	47.3	39.1	12.1	52.0	41.1	10.6	57.5	43.9	8.4
		45	37.4	34.4	12.9	43.3	37.0	11.1	47.4	38.9	9.7	52.0	41.2	7.6
		48	33.9	32.5	11.7	39.2	35.0	10.1	42.8	36.6	8.8	46.5	38.5	6.8
	85	40	47.8	43.3	16.3	55.7	47.0	14.2	61.4	49.6	12.5	68.2	53.2	9.9
		42	45.4	42.0	15.5	52.8	45.4	13.5	58.1	47.9	11.8	64.2	51.1	9.3
		45	41.7	40.0	14.3	48.3	43.1	12.4	52.9	45.2	10.8	58.1	47.9	8.5
		48	37.9	37.8	13.0	43.7	40.7	11.2	47.7	42.6	9.8	51.9	44.8	7.6
	90	40	53.3	49.1	18.2	62.1	53.2	15.8	68.5	56.2	13.9	76.0	60.3	11.0
		42	50.6	47.6	17.3	58.8	51.5	15.0	64.7	54.2	13.2	71.6	57.8	10.4
		45	46.5	45.3	15.9	53.8	48.8	13.8	59.0	51.2	12.0	64.7	54.2	9.4
		48	42.2	42.2	14.5	48.7	46.1	12.5	53.2	48.2	10.9	57.8	50.7	8.4
67	75	40	48.3	25.6	16.5	56.3	27.7	14.4	62.1	29.3	12.7	69.0	31.4	10.0
		42	45.9	24.8	15.7	53.3	26.8	13.6	58.7	28.2	12.0	64.9	30.1	9.4
		45	42.1	23.6	14.4	48.8	25.4	12.5	53.5	26.7	10.9	58.7	28.2	8.6
		48	38.3	22.3	13.2	44.2	24.0	11.3	48.2	25.1	9.9	52.4	26.4	7.7
	80	40	50.7	33.1	17.3	59.1	35.9	15.1	65.1	37.9	13.3	72.3	40.6	10.5
		42	48.2	32.1	16.4	55.9	34.7	14.3	61.6	36.5	12.6	68.1	39.0	9.9
		45	44.2	30.5	15.1	51.2	32.9	13.1	56.1	34.5	11.5	61.6	36.5	9.0
		48	40.2	28.9	13.8	46.4	31.1	11.9	50.6	32.5	10.4	55.0	34.2	8.0
	85	40	54.0	40.4	18.4	62.9	43.8	16.0	69.3	46.2	14.1	77.0	49.6	11.2
		42	51.3	39.2	17.5	59.6	42.3	15.2	65.5	44.6	13.3	72.5	47.6	10.5
		45	47.1	37.3	16.1	54.5	40.1	13.9	59.8	42.1	12.2	65.6	44.6	9.5
		48	42.8	35.3	14.7	49.4	37.9	12.6	53.9	39.7	11.0	58.6	41.7	8.5
	90	40	57.9	47.5	19.7	67.5	51.4	17.2	74.4	54.3	15.1	82.6	58.3	12.0
		42	55.0	46.0	18.7	63.9	49.8	16.3	70.3	52.4	14.3	77.8	55.9	11.3
		45	50.5	43.8	17.2	58.5	47.2	14.9	64.1	49.5	13.1	70.3	52.4	10.2
		48	45.9	41.4	15.7	53.0	44.6	13.5	57.8	46.6	11.8	62.8	49.0	9.1
70	75	40	55.0	22.4	18.7	64.1	24.3	16.3	70.7	25.6	14.4	78.5	27.5	11.4
		42	52.2	21.7	17.8	60.7	23.5	15.5	66.8	24.7	13.6	73.8	26.4	10.7
		45	48.0	20.6	16.4	55.5	22.2	14.2	60.9	23.3	12.4	66.8	24.7	9.7
		48	43.6	19.5	14.9	50.3	21.0	12.9	54.9	22.0	11.2	59.7	23.1	8.7
	80	40	56.5	30.0	19.2	65.8	32.6	16.7	72.6	34.4	14.8	80.6	36.9	11.7
		42	53.7	29.1	18.3	62.3	31.5	15.9	68.6	33.2	14.0	75.9	35.4	11.0
		45	49.3	27.7	16.8	57.1	29.9	14.6	62.6	31.3	12.7	68.6	33.2	10.0
		48	44.8	26.2	15.3	51.7	28.2	13.2	56.4	29.5	11.5	61.3	31.0	8.9
	85	40	59.0	37.6	20.1	68.7	40.8	17.5	75.7	43.1	15.4	84.1	46.2	12.2
		42	56.0	36.5	19.1	65.1	39.5	16.6	71.6	41.6	14.6	79.2	44.3	11.5
		45	51.4	34.7	17.5	59.5	37.4	15.2	65.3	39.3	13.3	71.6	41.6	10.4
		48	46.7	32.9	16.0	53.9	35.3	13.8	58.9	37.0	12.0	64.0	38.9	9.3
	90	40	62.2	45.1	21.1	72.4	48.9	18.4	79.8	51.6	16.2	88.7	55.3	12.8
		42	59.0	43.7	20.1	68.6	47.3	17.4	75.5	49.8	15.3	83.4	53.1	12.1
		45	54.2	41.6	18.5	62.8	44.8	16.0	68.8	47.0	14.0	75.5	49.8	11.0
		48	49.2	39.4	16.8	56.8	42.3	14.5	62.1	44.3	12.6	67.4	46.6	9.8

Table 41. VUV 150, cooling coil J (DX)

Size	EWB	Suct Temp	EDB = 70°F				EDB = 75°F				EDB = 80°F				EDB = 85°F			
			TC	SC	LDB	LWB	TC	SC	LDB	LWB	TC	SC	LDB	LWB	TC	SC	LDB	LWB
1500	61	40	41.7	27.5	53.0	51.1	45.6	36.3	52.5	50.0	50.5	44.5	52.4	48.6	56.5	52.2	52.7	46.9
		45	34.9	25.0	54.5	52.8	38.2	33.0	54.6	51.9	42.4	40.5	54.9	50.8	47.3	47.3	55.7	49.4
		50	28.2	22.5	56.1	54.5	30.9	29.7	56.6	53.8	34.2	34.2	58.8	52.9	38.2	38.2	61.3	51.9
	64	40	49.5	23.7	55.3	52.8	52.2	33.4	54.3	52.1	55.5	42.4	53.7	51.2	59.7	51.0	53.4	50.0
		45	41.5	21.6	56.6	54.8	43.7	30.4	56.2	54.2	46.5	38.6	56.1	53.5	50.1	46.4	56.3	52.5
		50	33.5	19.4	58.0	56.7	35.3	27.3	58.1	56.2	37.6	34.7	58.5	55.6	40.4	40.4	60.0	54.9
	67	40	58.6	19.0	58.2	54.5	60.5	29.2	56.9	53.9	62.7	38.9	55.9	53.3	65.6	48.2	55.1	52.5
		45	49.1	17.3	59.3	56.8	50.7	26.6	58.5	56.3	52.6	35.4	58.1	55.8	55.0	43.8	57.9	55.2
		50	39.7	15.5	60.4	58.9	40.9	23.9	60.2	58.6	42.4	31.8	60.3	58.2	44.4	39.4	60.6	57.7
	70	40					70.1	24.1	60.1	55.7	71.7	34.2	58.8	55.2	73.6	44.0	57.7	54.7
		45					58.8	21.9	61.4	58.3	60.1	31.1	60.7	58.0	61.7	40.0	60.2	57.5
		50					47.4	19.7	62.8	60.8	48.5	28.0	62.7	60.5	49.8	36.0	62.7	60.2
	73	40									82.0	28.6	62.3	57.1	83.3	38.6	61.1	56.7
		45									68.7	26.0	63.9	60.0	69.8	35.1	63.3	59.7
		50									55.4	23.4	65.5	62.8	56.4	31.6	65.4	62.6

EDB = Entering Air Temperature, Dry Bulb (°F)
EWB = Entering Air Temperature, Wet Bulb (°F)
TC = Total Capacity (MBh)
SC = Sensible Capacity (MBh)
LDB = Leaving Air Temperature, Dry Bulb (°F)
LWB = Leaving Air Temperature, Wet Bulb (°F)

Table 42. Airflow correction (% of design airflow)

%	Total Capacity (MBh)	Sensible Capacity (MBh)
120	1.025	1.105
110	1.012	1.051
100	1.000	0.998
90	0.987	0.945
80	0.974	0.892

Table 43. Airflow through coil J

Unit Model	1500
Rated cfm	1495+

Table 44. VUV 150, hydronic heating coils A (1-row / 12 fpi), B (2-row / 12 fpi), C (2-row / 16 fpi)

			Flow Rate (gpm)					
			2		4		6	
Coil	Entering Air Temp, Dry Bulb (°F)	Entering Water Temp (°F)	Total Capacity (MBh)	Waterside Temp Drop (°F)	Total Capacity (MBh)	Waterside Temp Drop (°F)	Total Capacity (MBh)	Waterside Temp Drop (°F)
A	50	120	35.1	33.9	44.1	21.5	48.3	15.7
		140	48.9	47.7	61.8	30.3	67.7	22.2
		160	62.7	61.5	79.6	39.2	87.1	28.6
		180	76.5	75.3	97.5	48.2	106.6	35.1
	55	120	33.2	32.0	41.7	20.3	45.7	14.8
		140	46.3	45.1	58.5	28.7	64.0	20.9
		160	59.3	58.1	75.3	37.1	82.4	27.1
		180	72.4	71.2	92.2	45.5	100.8	33.2
	60	120	31.3	30.1	39.3	19.1	43.1	14.0
		140	43.6	42.4	55.2	27.0	60.4	19.7
		160	55.9	54.7	71.0	34.9	77.7	25.5
		180	68.3	67.1	87.0	42.9	95.1	31.3
	65	120	29.5	28.3	37.0	17.9	40.5	13.1
		140	41.0	39.8	51.9	25.4	56.8	18.5
		160	52.6	51.4	66.8	32.8	73.1	24.0
		180	64.2	63.0	81.8	40.3	89.4	29.4
	70	120	27.6	26.4	34.6	16.7	37.9	12.2
		140	38.4	37.2	48.5	23.7	53.1	17.3
		160	49.2	48.0	62.5	30.7	68.4	22.4
		180	60.0	58.8	76.5	37.7	83.7	27.5
B	50	120	39.0	37.8	54.5	26.7	63.0	20.6
		140	53.9	52.7	76.9	37.9	88.7	29.2
		160	68.9	67.7	99.4	49.1	114.4	37.7
		180	84.0	82.8	122.0	60.4	140.2	46.3
	55	120	36.9	35.7	51.5	25.2	59.6	19.5
		140	51.0	49.8	72.7	35.8	83.9	27.6
		160	65.2	64.0	94.0	46.4	108.2	35.7
		180	79.5	78.3	115.4	57.1	132.6	43.8
	60	120	34.8	33.6	48.6	23.7	56.2	18.3
		140	48.1	46.9	68.6	33.7	79.1	26.0
		160	61.5	60.3	88.7	43.8	102.1	33.6
		180	75.0	73.8	108.8	53.8	125.1	41.3
	65	120	32.7	31.5	45.7	22.3	52.8	17.2
		140	45.2	44.0	64.5	31.7	74.4	24.4
		160	57.8	56.6	83.4	41.1	96.0	31.6
		180	70.5	69.3	102.3	50.6	117.6	38.8
	70	120	30.6	29.4	42.7	20.8	49.4	16.1
		140	42.3	41.1	60.3	29.6	69.6	22.8
		160	54.1	52.9	78.0	38.4	89.8	29.5
		180	65.9	64.7	95.7	47.3	110.0	36.3
C	50	120	39.5	38.3	56.0	27.4	65.0	21.3
		140	54.5	53.3	79.1	39.0	91.5	30.1
		160	69.7	68.5	102.2	50.5	118.1	39.0
		180	84.9	83.7	125.3	62.1	144.6	47.8
	55	120	37.3	36.1	53.0	25.9	61.5	20.1
		140	51.6	50.4	74.8	36.8	86.6	28.5
		160	65.9	64.7	96.7	47.8	111.7	36.8
		180	80.3	79.1	118.6	58.7	136.8	45.2
	60	120	35.2	34.0	50.0	24.4	58.0	18.9
		140	48.6	47.4	70.6	34.7	81.7	26.8
		160	62.2	61.0	91.2	45.0	105.3	34.7
		180	75.8	74.6	111.8	55.3	129.1	42.6
	65	120	33.1	31.9	47.0	22.9	54.6	17.8
		140	45.7	44.5	66.3	32.6	76.8	25.2
		160	58.4	57.2	85.7	42.3	99.0	32.6
		180	71.2	70.0	105.1	52.0	121.3	40.0
	70	120	31.0	29.8	44.0	21.4	51.1	16.6
		140	42.8	41.6	62.1	30.5	71.8	23.5
		160	54.7	53.5	80.2	39.5	92.7	30.5
		180	66.7	65.5	98.4	48.6	113.5	37.4

Table 45. VUV 150, steam heating coils K (low-capacity), L (high-capacity)

			Steam Pressure (psig)					
			5		10		15	
Size	Coil	Entering Air Temp, Dry Bulb (°F)	Total Capacity (MBh)	Airside Temp Rise (°F)	Total Capacity (MBh)	Airside Temp Rise (°F)	Total Capacity (MBh)	Airside Temp Rise (°F)
1500	K	0	141.1	87.1	148.4	91.6	154.7	95.5
		10	134.8	83.2	142.1	87.7	148.4	91.6
		20	128.6	79.4	135.9	83.9	142.2	87.8
		30	122.4	75.6	129.7	80.1	136.0	83.9
		40	116.2	71.7	123.5	76.2	129.8	80.1
		50	110.0	67.9	117.3	72.4	123.6	76.3
		60	103.8	64.1	111.1	68.6	117.4	72.5
		70	97.6	60.2	104.9	64.8	111.2	68.6
	L	0	208.2	128.5	219.0	135.2	228.2	140.9
		10	199.0	122.9	209.9	129.5	219.1	135.2
		20	189.9	117.2	200.7	123.9	209.9	129.6
		30	180.8	111.6	191.6	118.2	200.8	123.9
		40	171.6	105.9	182.4	112.6	191.6	118.3
		50	162.5	100.3	173.2	106.9	182.5	112.6
		60	153.3	94.6	164.1	101.3	173.3	107.0
		70	144.1	89.0	154.9	95.6	164.1	101.3

psig = steam pressure ($lb/in.^2$ gage)

Table 46. VUV 075–150, electrical performance

		Blower Motor				Electric Heat					Low FLA Option	
Model #	Unit Voltage	FLA (ea.)	HP	# Fan Motors	# Heating Elements	kW	Amp	Total FLA	Minimum Circuit Ampacity	Overcurrent Protection Device	Total FLA	Minimum Circuit Ampacity
VUVE075	115/60/1	3.5	0.25	1	0	0	0	3.5	4.375	15	2.8	3.5
	208/60/1	2.1	0.25	1	0	0	0	2.1	2.625	15	1.68	2.1
	208/60/1	2.1	0.25	1	3	4.39	21.1	23.2	29	30	22.78	28.475
	208/60/1	2.1	0.25	1	4	5.86	28.2	30.3	37.875	40	29.88	37.35
	208/60/1	2.1	0.25	1	6	8.79	42.3	44.4	55.5	60	43.98	54.975
	208/60/3	2.1	0.25	1	0	0	0	2.1	2.625	15	1.68	2.1
	208/60/3	2.1	0.25	1	3	4.39	12.2	14.3	17.875	20	13.88	17.35
	208/60/3	2.1	0.25	1	4	5.86	18.69	20.8	25.9875	30	20.37	25.4625
	208/60/3	2.1	0.25	1	6	8.79	24.4	26.5	33.125	40	26.08	32.6
	230/60/1	2.1	0.25	1	0	0	0	2.1	2.625	15	1.68	2.1
	230/60/1	2.1	0.25	1	3	5.85	24.4	26.5	33.125	40	26.08	32.6
	230/60/1	2.1	0.25	1	4	7.8	32.5	34.6	43.25	50	34.18	42.725
	230/60/1	2.1	0.25	1	6	11.7	48.8	50.9	63.625	70	50.48	63.1
	230/60/3	2.1	0.25	1	0	0	0	2.1	2.625	15	1.68	2.1
	230/60/3	2.1	0.25	1	3	5.85	14.1	16.2	20.25	20	15.78	19.725
	230/60/3	2.1	0.25	1	4	7.8	21.49	23.6	29.4875	30	23.17	28.9625
	230/60/3	2.1	0.25	1	6	11.7	28.1	30.2	37.75	40	29.78	37.225
	277/60/1	1.6	0.25	1	0	0	0	1.6	2	15	1.28	1.6
	277/60/1	1.6	0.25	1	3	5.82	21	22.6	28.25	30	22.28	27.85
	277/60/1	1.6	0.25	1	4	7.8	28.2	29.8	37.25	40	29.48	36.85
	277/60/1	1.6	0.25	1	6	11.7	42.2	43.8	54.75	60	43.48	54.35
	460/60/3	1.6	0.25	1	0	0	0	1.6	2	15	1.28	1.6
	460/60/3	1.6	0.25	1	3	5.85	7	8.6	10.75	15	8.28	10.35
	460/60/3	1.6	0.25	1	4	7.8	14.1	15.7	19.625	20	15.38	19.225
	460/60/3	1.6	0.25	1	6	11.7	14.1	15.7	19.625	20	15.38	19.225
VUVE100	115/60/1	3.5	0.25	1	0	0	0	3.5	4.375	15	2.8	3.5
	208/60/1	2.1	0.25	1	0	0	0	2.1	2.625	15	1.68	2.1
	208/60/1	2.1	0.25	1	3	5.86	28.2	30.3	37.875	40	29.88	37.35
	208/60/1	2.1	0.25	1	4	7.81	37.5	39.6	49.5	50	39.18	48.975
	208/60/1	2.1	0.25	1	6	11.72	56.3	58.4	73	80	57.98	72.475
	208/60/3	2.1	0.25	1	0	0	0	2.1	2.625	15	1.68	2.1
	208/60/3	2.1	0.25	1	3	5.86	16.3	18.4	23	25	17.98	22.475
	208/60/3	2.1	0.25	1	4	7.81	24.79	26.9	33.6125	40	26.47	33.0875
	208/60/3	2.1	0.25	1	6	11.72	32.5	34.6	43.25	50	34.18	42.725
	230/60/1	2.1	0.25	1	0	0	0	2.1	2.625	15	1.68	2.1
	230/60/1	2.1	0.25	1	3	7.8	32.5	34.6	43.25	50	34.18	42.725
	230/60/1	2.1	0.25	1	4	10.4	43.3	45.4	56.75	60	44.98	56.225
	230/60/1	2.1	0.25	1	6	15.6	65	67.1	83.875	90	66.68	83.35
	230/60/3	2.1	0.25	1	0	0	0	2.1	2.625	15	1.68	2.1
	230/60/3	2.1	0.25	1	3	7.8	18.8	20.9	26.125	30	20.48	25.6
	230/60/3	2.1	0.25	1	4	10.4	28.66	30.8	38.45	40	30.34	37.925
	230/60/3	2.1	0.25	1	6	15.6	37.5	39.6	49.5	50	39.18	48.975
	277/60/1	1.6	0.25	1	0	0	0	1.6	2	15	1.28	1.6
	277/60/1	1.6	0.25	1	3	7.8	28.2	29.8	37.25	40	29.48	36.85
	277/60/1	1.6	0.25	1	4	10.4	37.5	39.1	48.875	50	38.78	48.475
	277/60/1	1.6	0.25	1	6	15.6	56.3	57.9	72.375	80	57.58	71.975
	460/60/3	1.6	0.25	1	0	0	0	1.6	2	15	1.28	1.6
	460/60/3	1.6	0.25	1	3	7.8	9.4	11.0	13.75	15	10.68	13.35
	460/60/3	1.6	0.25	1	4	10.4	18.8	20.4	25.5	30	20.08	25.1
	460/60/3	1.6	0.25	1	6	15.6	18.8	20.4	25.5	30	20.08	25.1

Table 46. VUV 075–150, electrical performance (continued)

		Blower Motor				Electric Heat					Low FLA Option	
Model #	Unit Voltage	FLA (ea.)	HP	# Fan Motors	# Heating Elements	kW	Amp	Total FLA	Minimum Circuit Ampacity	Overcurrent Protection Device	Total FLA	Minimum Circuit Ampacity
VUVE125	115/60/1	7.0	0.25	2	0	0	0	7.0	8.75	15	3.5	4.375
	208/60/1	4.2	0.25	2	0	0	0	4.2	5.25	15	3.36	4.2
	208/60/1	4.2	0.25	2	3	7.32	35.2	39.4	49.25	50	38.56	48.2
	208/60/1	4.2	0.25	2	4	9.76	46.9	51.1	63.875	70	50.26	62.825
	208/60/1	4.2	0.25	2	6	14.65	70.4	74.6	93.25	100	73.76	92.2
	208/60/3	4.2	0.25	2	0	0	0	4.2	5.25	15	3.36	4.2
	208/60/3	4.2	0.25	2	3	7.32	20.3	24.5	30.625	30	23.66	29.575
	208/60/3	4.2	0.25	2	4	9.76	31.03	35.2	44.0375	50	34.39	42.9875
	208/60/3	4.2	0.25	2	6	14.65	40.7	44.9	56.125	60	44.06	55.075
	230/60/1	4.2	0.25	2	0	0	0	4.2	5.25	15	3.36	4.2
	230/60/1	4.2	0.25	2	3	9.75	40.6	44.8	56	60	43.96	54.95
	230/60/1	4.2	0.25	2	4	13	54.2	58.4	73	80	57.56	71.95
	230/60/1	4.2	0.25	2	6	19.5	81.3	85.5	106.875	125	84.66	105.825
	230/60/3	4.2	0.25	2	0	0	0	4.2	5.25	15	3.36	4.2
	230/60/3	4.2	0.25	2	3	9.75	23.5	27.7	34.625	40	26.86	33.575
	230/60/3	4.2	0.25	2	4	13	35.82	40.0	50.025	50	39.18	48.975
	230/60/3	4.2	0.25	2	6	19.5	46.9	51.1	63.875	70	50.26	62.825
	277/60/1	3.2	0.25	2	0	0	0	3.2	4	15	2.56	3.2
	277/60/1	3.2	0.25	2	3	9.75	35.2	38.4	48	50	37.76	47.2
	277/60/1	3.2	0.25	2	4	13	46.9	50.1	62.625	70	49.46	61.825
	277/60/1	3.2	0.25	2	6	19.5	70.4	73.6	92	100	72.96	91.2
	460/60/3	3.2	0.25	2	0	0	0	3.2	4	15	2.56	3.2
	460/60/3	3.2	0.25	2	3	9.75	11.7	14.9	18.625	20	14.26	17.825
	460/60/3	3.2	0.25	2	4	13	23.5	26.7	33.375	40	26.06	32.575
	460/60/3	3.2	0.25	2	6	19.5	23.5	26.7	33.375	40	26.06	32.575
VUVE150	115/60/1	7.0	0.25	2	0	0	0	7.0	8.75	15	3.5	4.375
	208/60/1	4.2	0.25	2	0	0	0	4.2	5.25	15	3.36	4.2
	208/60/1	4.2	0.25	2	3	8.56	41.2	45.4	56.75	60	44.56	55.7
	208/60/1	4.2	0.25	2	4	11.42	54.9	59.1	73.875	80	58.26	72.825
	208/60/1	4.2	0.25	2	6	17.13	82.4	86.6	108.25	125	85.76	107.2
	208/60/3	4.2	0.25	2	0	0	0	4.2	5.25	15	3.36	4.2
	208/60/3	4.2	0.25	2	3	8.56	23.8	28.0	35	40	27.16	33.95
	208/60/3	4.2	0.25	2	4	11.42	36.36	40.6	50.7	50	39.72	49.65
	208/60/3	4.2	0.25	2	6	17.13	47.5	51.7	64.625	70	50.86	63.575
	230/60/1	4.2	0.25	2	0	0	0	4.2	5.25	15	3.36	4.2
	230/60/1	4.2	0.25	2	3	11.4	47.5	51.7	64.625	70	50.86	63.575
	230/60/1	4.2	0.25	2	4	15.2	63.3	67.5	84.375	90	66.66	83.325
	230/60/1	4.2	0.25	2	6	22.8	95	99.2	124	125	98.36	122.95
	230/60/3	4.2	0.25	2	0	0	0	4.2	5.25	15	3.36	4.2
	230/60/3	4.2	0.25	2	3	11.4	27.4	31.6	39.5	40	30.76	38.45
	230/60/3	4.2	0.25	2	4	15.2	41.87	46.1	57.5875	60	45.23	56.5375
	230/60/3	4.2	0.25	2	6	22.8	54.8	59.0	73.75	80	58.16	72.7
	277/60/1	3.2	0.25	2	0	0	0	3.2	4	15	2.56	3.2
	277/60/1	3.2	0.25	2	3	11.4	41.2	44.4	55.5	60	43.76	54.7
	277/60/1	3.2	0.25	2	4	15.2	54.9	58.1	72.625	80	57.46	71.825
	277/60/1	3.2	0.25	2	6	22.8	82.3	85.5	106.875	125	84.86	106.075
	460/60/3	3.2	0.25	2	0	0	0	3.2	4	15	2.56	3.2
	460/60/3	3.2	0.25	2	3	11.4	13.7	16.9	21.125	20	16.26	20.325
	460/60/3	3.2	0.25	2	4	15.2	27.4	30.6	38.25	40	29.96	37.45
	460/60/3	3.2	0.25	2	6	22.8	27.4	30.6	38.25	40	29.96	37.45

Controls

Why Trane Controls?

Whether involved in a retrofit or in new construction applications, Trane has the control design to fit the systems requirements. The broad range of control packages offer a range from a field convertible end-device package, to a complete building automation system solution with LonTalk® controls.

The good news is Trane® controls are factory-mounted, -wired, -tested and configured or programmed with Trane® application expertise to provide comfort, efficiency, and reliability, as well as, single-source warranty and service. With Trane's integrated controls, the installed costs are lower because the equipment has turn-key factory controls and every component of the system is optimized to fit with the controller. Trane installs not only the controller, but also the hardware that works intimately with the controller to allow the system to function properly (i.e., piping package, valves, dampers, actuators, etc.). When a classroom unit ventilator with Trane® controls arrives to the jobsite, it is completely ready for quick installation.

Table 47. Controller input/output summary

	ZN520	UC400
Binary Outputs		X
3-Speed Fan	X	X
2-Position Hydronic Valve	X	X
2-Position Fresh Air Damper		X
1-Stage Electric Heat	X	X
3-Wire Economizer Damper	X	X
3-Wire Hydronic Valve	X	X
2-Stage Electric Heat	X	X
Reheat (hydronic or electric)	X	X
Generic	X	(a)
Binary Inputs		
Condensate Overflow Detection	X	X
Low Temperature Detection	X	X
Occupancy	X	X
Generic Input	X	(a)
Analog Inputs		
Zone Temperature	X	X
Setpoint	X	X
Fan Mode: Auto, High, Medium, Low	X	X
Entering Water	X	X
Discharge Air	X	X
Outside Air	X	X
Generic	X	(a)
Analog Outputs		
Variable speed fan		X
Field supplied analog valves		X

(a) The generic input and output are for use with a Tracer Summit system only.

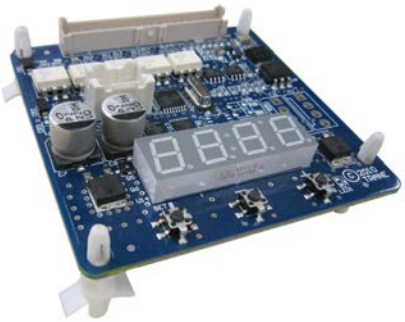
Table 48. Controller function summary

	ZN520	UC400
Control Functions		
Entering Water Temp. Sampling (Purge)	X	X
Auto Changeover	X	X
Fan Cycling		
Warm-Up	X	
Pre-Cool	X	
Data Sharing (Master/Slave)	X	
Random Start	X	X
Dehumidification	X	X
Single Zone VAV		X
Staged Capacity (2-Stage Electric Supplementary)	X	X
Other Functions		
Manual Test	X	in TU
Maintenance Timer	X	X
Setpoint Limits	X	X

ECM Engine Controller

The Electronically Commutated Motor (ECM) engine controls and reports the performance of up to two Trane Brushless DC (BLDC) motors.

Figure 20. ECM engine controller



- The engine also coordinates the operation of the fan in response to electric heat behavior and electric behavior in response to hydronic heat behavior.
- The engine incorporates a user interface that allows adjustment of certain unit parameters and provides constant feedback on motor operation.
- The engine integrates service and troubleshooting tools.
- The engine integrates a versatile configurable auxiliary temperature sensor.
- The engine incorporates various safety and lockout features, such as maintaining proper fan speeds if electric heat is called for.

Status Display

Figure 21. Status display

The ECM engine board contains a four-digit, seven-segment display that is used to present information in a format close to real-world language, while having a small-form factor. Most characters are immediately recognizable; however, please consult Table 49 and Table 50 for the graphical representation of each alphanumeric character.

Table 49. Screen representation of alphabetical characters

A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z
A	b	C	d	E	F	g	H	I	J	H	L	m	n	O	P	q	r	S	t	U	u	W	H	y	Z

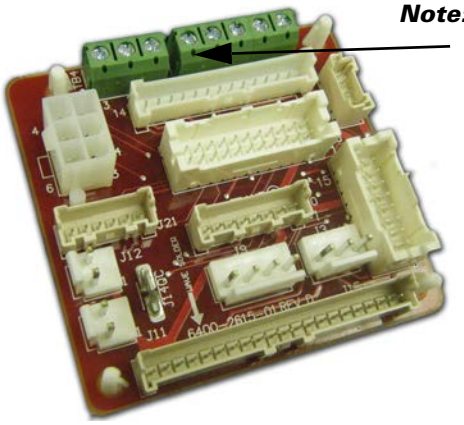
Table 50. Screen representation of numeric characters

1	2	3	4	5	6	7	8	9	0
1	2	3	4	5	6	7	8	9	0

Fan Speed Switch

Figure 22. Fan speed switch

Figure 23. Adapter board



Note: *Customer Low-Voltage Interface for Fan Speeds, Variable Fan Speed, and 24 Vac Supply*

The adapter allows direct customer interfacing through the use of terminal strips. Standard interfacing includes:

- Fan Speeds (H, M, L) (for wall mounted fan speed switches)
- Variable speed (0–10V) inputs

The standard adapter board eliminates many separate wiring harnesses in the panel and allows simple, mistake-proofed single-plug interfacing of:

- The ECM engine controller
- Transformers
- Motors
- Valves
- Dampers
- Electric heat control
- Fan speed switches
- Main power (except electric heat)

The manual fan mode switch is available for fan-coil units that do not have Trane factory-mounted control packages. This four-position switch (off, high, medium, low) allows manual fan mode selection and is available unit or wall mounted. The unit-mounted option operates on line voltage. The wall-mounted option is low-voltage and has three 24-volt relays using a factory-wired transformer and relays to control the fan motor.

Customer Supplied Terminal Interface (CSTI)

Figure 24. CSTI adapter board

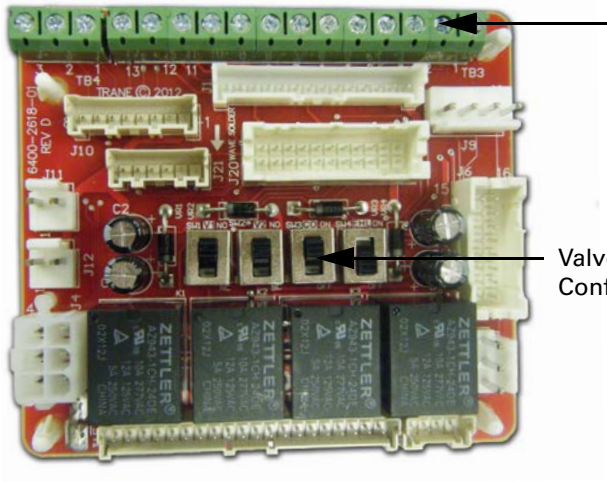
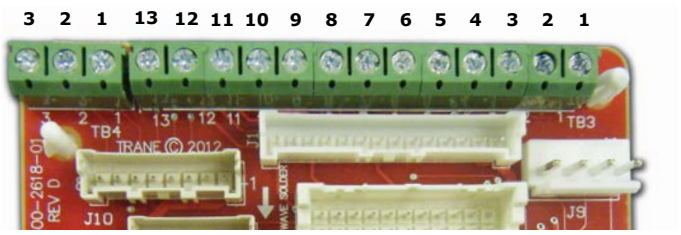

Customer Low-Voltage Interface for Valves, Electric Heat, Dampers, Fan Speeds, Variable Fan Speed, and 24 Vac Supply
Valve(s), Electric Heat, and Changeover Configuration Switches (Factory-Set)

Figure 25. CSTI adapter board field connections



1. VSP 10V
2. VSP 0–10V
3. VSP DC COM

1. 24 Vac Y (hot)
2. 24 Vac Y (gnd)
3. High
4. Medium
5. Low
6. V1Op/Cooling
7. V1C1 (not std)
8. Not used
9. Not used
10. V2Op/EH1St/Heating
11. V2C1/EH2St (not std)
12. Damper Open
13. Dmp Cl (not std)

The control interface is intended to be used with a field-supplied, low-voltage thermostat or controller. The control box contains a relay board which includes a line voltage to 24-volt transformer, quiet contactors (for electric heat units), and an optional disconnect switch. All end devices are wired to a low-voltage terminal block and are run-tested, so the only a power connection and thermostat connection is needed to commission the unit. Changeover sensors and controls are provided whenever a change-over coil is selected. When N.O. valves are selected, inverting relays are provided for use with standard thermostats.

The CSTI adapter board provides all the hookups of the standard adapter board, but in addition, provides hookups for valve control (main and auxiliary coils), electric heat control, and damper control. Screw terminal blocks provide convenient access to fan controls and to end device control. In addition, a courtesy 10-Vdc supply is provided for use with an external potentiometer or rheostat. The 10-Vdc supply supports up to 10 mA draw.

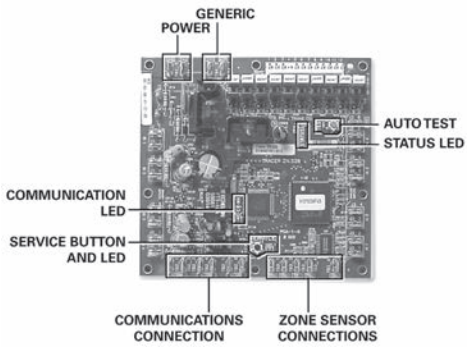
Tracer ZN520 Zone Controller

Features Include

- Automatic fan-speed reset
- Automatic ventilation reset
- Active dehumidification
- Manual output test
- Filter maintenance
- Master slave
- Water valve override
- Freeze avoidance
- Interoperability
- Three generic I/O ports

The Tracer ZN520 is a factory-installed, -tested and -commissioned LonTalk® control board designed to provide control of the classroom unit ventilator and the fan-coil products (see Figure 26).

Figure 26. Tracer ZN520 control board

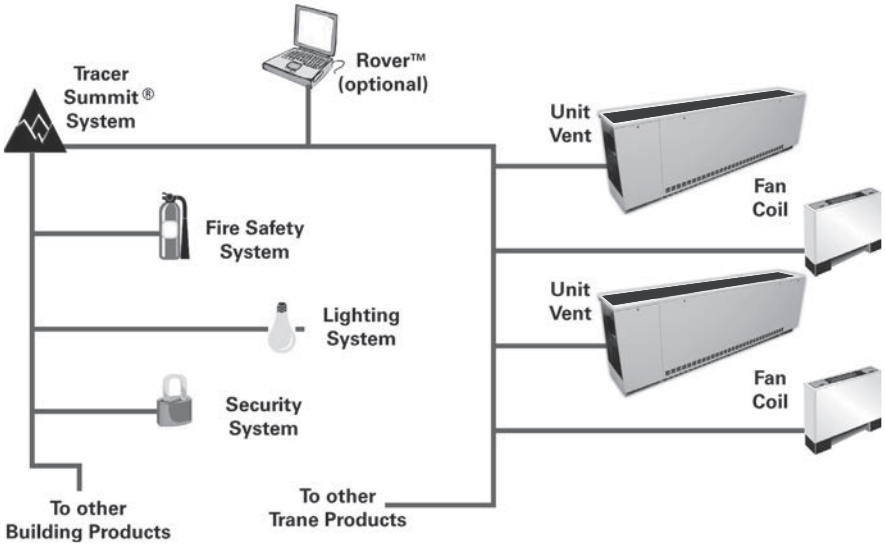


The Tracer ZN520 controller is designed to be used in the following applications:

- As part of the Trane Tracer Summit building automation system, the Tracer ZN520 becomes an important part of the Trane Integrated Comfort system (ICS).
- The Tracer ZN520 can function as a completely standalone controller in situations where a building automation system (BAS) is not present.
- For situations when a non-Trane BAS is present, the Tracer ZN520 can be where ever a LonTalk front-end system is present.

Through building management of the HVAC system, optimizing energy consumption becomes possible at a classroom level. Each unit is capable of functioning independently of one another during occupied and unoccupied hours of the day. This allows the temperature setpoint and ventilation setting to be changed automatically based on classroom usage (see Figure 27, p. 70).

Figure 27. Tracer ZN520 system



Two Systems in One

In an ICS environment, the Tracer ZN520 is pre-designed to install quickly and easily into the system. Since the controller and the unit are factory tested and commissioned, the start-up time for the entire system is minimized. Trane becomes the single source of responsibility for the equipment, unit controls, and building automation system.

As a standalone controller, the Tracer ZN520 is ideally suited for fix-on-fail replacement of units with old pneumatic controllers, or in situations where a BAS will be added at a later date. Once power is applied to the controller, it will automatically start up and run based upon the setpoint on the local zone sensor. An individual time clock can be added to the unit for local scheduling.

The Tracer ZN520 is certified to the interoperable LonMark® Space Comfort Controller profile. This allows the controller to be used with another vendor's BAS and thereby still provide the high quality of factory installation and testing. In addition, the Tracer ZN520 provides one of the most extensive interoperable data lists of any controller of its type in the industry.

Tracer ZN520 Features Include

Automatic Fan and Ventilation Reset. With the Tracer ZN520 controller, a multi-speed fan control for the unit ventilator delivers the airflow output customized to support the cfm space needs. When less cfm is necessary to meet the load of the classroom (typically 75 to 80 percent of the time), the equipment operates on low speed. However, if the room temperature rises, the controller will switch to high speed, and the outside air damper will adjust to satisfy the space needs. This helps maintain the proper amount of ventilation air to the occupants independent of the fan speed. As part of the ventilation strategy, the controller will reposition the outside air damper to confirm the minimum outside air cfm is met at both operating conditions.

Manual Output Test . The Tracer ZN520 controller includes a manual output test function. This function may be initiated from the blue test push button on the controller or through the Rover™ service tool. This feature is used to manually exercise the outputs in a defined sequence.

The purpose of this test sequence is to verify output and end device operation. The manual output test function may also be used in the following situations:

- Reset latching diagnostics
- Verify output wiring and operation

- Force the water valve(s) open to balance the hydronic system during installation set-up or service.

Filter Maintenance. Filter status for the controller is based on the cumulative run hours of the unit fan. The controller compares the amount of fan run time against an adjustable fan run hour (stored in the controller) to determine when maintenance is recommended for the unit. The run-hours value may be user edited as required (through Rover). The valid range for the fan run hours limit is 0 to 5000 hours with a default of 600 hours. Once the run hours limit has been exceeded, the controller generates a *maintenance required diagnostic* (unit will not shut-down). The user will be notified of this diagnostic through the building automation system or when a Trane Service Tool is communicating with the controller.

Active Dehumidification. On unit ventilators with reheat coils, the Tracer ZN520 can provide active dehumidification to the classroom. This means that the classroom relative humidity can be kept below an adjustable setpoint independent outdoor weather conditions. Indoor humidity levels are recommended by ASHRAE to be kept below 60 percent in order to minimize microbial growth and the life span of airborne illness causing germs.

Master Slave *(Data Sharing).* Because the Tracer ZN520 controller utilizes LonWorks® technology, the controller can send or receive data (setpoint, heat/cool mode, fan request, space temperature, etc.) to and from other controllers on the communication link with or without the existence of a building automation system. This applies to applications where multiple units might share one zone sensor for both stand-alone (with communication wiring between units) and a building automation system.

Water Valve Override. The Tracer ZN520 can be commanded via the Rover service tool to open all hydronic valves 100 percent. This allows for the faster water balancing of each unit and the entire system when the command is sent globally to all controllers. A properly balanced system is essential for proper and efficient operation.

Hydronic Coil Freeze Protection (Freeze Avoidance). Unit ventilator systems in cold climates need to take precautions to avoid hydronic coil freeze-up. The Tracer ZN520 does this from three different aspects. Any of these methods of protections will result in the unit fan being disabled, the outside air damper being shut, and the hydronic valves being opened 100 percent.

The three methods of freeze avoidance include:

1. A binary freeze protection thermostat is mounted on the coil and will cause a latching diagnostic if the coil temperature falls below 35°F.
2. An analog discharge air sensor monitors the temperature of the air coming off of the coil and if the temperature falls below 40°F the outside air damper is closed, the fan is turned off and the valves are fully opened.
3. When in the unoccupied mode the Tracer ZN520 has an adjustable freeze avoidance setpoint. If the outside air temperature is below the setpoint the unit will open the valves to allow water to flow through the coils.

Interoperability. Interoperability allows the owner freedom to select multiple vendors, and multiple products. With this advantage, the owner can choose the best products, the best application, and the best service from a variety of suppliers to meet their evolving building control needs in a cost effective manner.

Generic Binary Input/Output. The three generic binary inputs/outputs are not part of the normal control, but are actually controlled through the Tracer Summit system (when present) to issue commands to the Tracer ZN520 control to turn the generic inputs/outputs of add-on equipment (such as baseboard heating, exhaust fans, occupancy sensor, lighting, etc.) on and off. This binary port is not affected when other binary diagnostics interrupt unit operation.

Tracer UC400

Figure 28.

The Tracer UC400 controller delivers single zone VAV control and can be used in a stand-alone application or as part of a Trane Integrated Comfort System (ICS).

In the stand-alone configuration, Tracer UC400 receives operation commands from the zone sensor and/or the auto changeover sensor (on auto changeover units). The entering water temperature is read from the auto changeover sensor and determines if the unit is capable of cooling or heating. The zone sensor module is capable of transmitting the following information to the controller:

- Timed override on/cancel request
- Zone setpoint
- Current zone temperature
- Fan mode selection (off-auto-high-med-low)

For optimal system performance, unit ventilators can operate as part of an Integrated Comfort System (ICS) building automation system controlled by Tracer Summit. The controller is linked directly to the Summit control panel via a twisted pair communication wire, requiring no additional interface device (i.e., a command unit). The Trane ICS system can monitor or override Tracer UC400 control points. This includes such points as temperature and output positions.

Tracer UC400 Zone Controller Features Include

- Single Zone VAV
- Automatic ventilation reset
- Active dehumidification
- Filter maintenance
- Water valve override
- Freeze avoidance
- Interoperability
- Unused I/O can be as generic I/O

The Tracer UC400 is a factory-installed, -tested, and -commissioned BACnet® MS/TP control designed to provide control of the classroom unit ventilator (see Figure 28). The Tracer UC400 controller is designed to be used in the following applications: as stand-alone operation, part of the Trane Tracer SC building automation system, or part of another BACnet MS/TP Building Automation System. The Tracer UC400 can function as a completely standalone controller in situations where a building automation system (BAS) is not present.

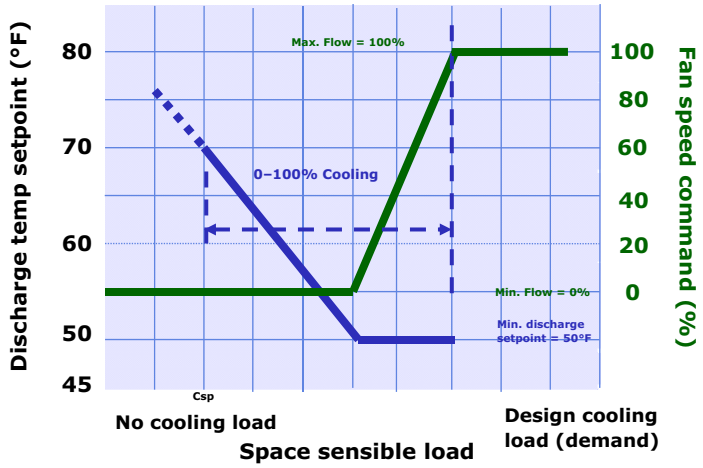
The Tracer UC400 is designed to install quickly and easily into the system. Since the controller and the unit are factory-tested and -commissioned, the start-up time for the entire system is minimized. Trane becomes the single source of responsibility for the equipment, unit controls, and building automation system. As a standalone controller, the Tracer UC400 is ideally suited for fix-on-fail

replacement of units with old pneumatic controllers, or in situations where a BAS will be added at a later date. Once power is applied to the controller, it will automatically start up and run based upon the setpoint on the local zone sensor. An individual time clock can be added to the unit for local scheduling. The Tracer UC400 is BTL listed as B-ASC profile. This ensures the controller to be used with other BACnet® building automation systems.

Tracer UC400 Features Include

Single Zone VAV with Fully Modulating Fan Speed. The Tracer UC400 will minimize fan speed, and in turn energy usage, by only delivering the air flow needed.

Figure 29. Cool mode nominal hydronic cooling control



Ventilation Reset. With the Tracer UC400 the unit ventilator delivers the airflow the space needs. When the air flow adjusts the outside air damper will also adjust to satisfy the space needs. This helps maintain the proper amount of ventilation air to the occupants independent of the fan speed. As part of the ventilation strategy, the controller will reposition the outside air damper to confirm the minimum outside airflow is met at both operating conditions.

Filter Maintenance. Filter status for the controller is based on the cumulative run hours of the unit fan. The controller compares the amount of fan run time against an adjustable fan run hour (stored in the controller) to determine when maintenance is recommended for the unit. The run-hours value may be user edited as required. The valid range for the fan run hours limit is 0 to 5000 hours with a default of 600 hours. Once the run hours limit has been exceeded, the controller generates a maintenance required diagnostic (unit will not shut-down). The user will be notified of this diagnostic through the building automation system or when a Trane® service tool is communicating with the controller.

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Hydronic Coil Freeze Protection (Freeze Avoidance). Unit ventilator systems in cold climates need to take precautions to avoid hydronic coil freeze-up. The controller does this from three different aspects. Any of these methods of protections will result in the unit fan being disabled, the outside air damper being shut, and the hydronic valves being opened 100 percent.

The three methods of freeze avoidance include:

1. A binary freeze protection thermostat is mounted on the coil and will cause a latching diagnostic if the coil temperature falls below 35°F.

2. An analog discharge air sensor monitors the temperature of the air coming off of the coil and if the temperature falls below 40°F the outside air damper is closed, the fan is turned off and the valves are fully opened.
3. When in the unoccupied mode, the controller has an adjustable freeze avoidance setpoint. If the outside air temperature is below the setpoint, the unit will open the valves to allow water to flow through the coils.

Zone Sensors

Zone sensors are available as either unit, wall, or split-mounted options for design flexibility. Unit ventilators with the unit-mounted zone sensor option include a thermistor in the unit's return air path. Wall-mounted zone sensor options have an internal thermistor. Zone sensors operate on 24 Vac.

Figure 30. Unit mtd temp sensor (SP, OCC/UNOCC, OALMH) (Electric heat with auto and off speeds)

X13790844-01 (unit)

Figure 31. Unit mtd display sensor (SP, OCC/UNOCC, COMM)

X13790886-04 (unit; 3-speed)

Figure 32. Unit mtd display sensor (SP, OCC/UNOCC, COMM)

X13790886-03 (unit; 2-speed)

Figure 33. Wall mtd temp sensor (SP, OCC/UNOCC, OALMH, COMM)

X13790842-02 (wall)
X13651467-01 (comm)

Figure 34. Wall mtd display sensor (SP, OCC/UNOCC, COMM)

X13790886-04 (wall; 3-speed)

Figure 35. Wall mtd display sensor (SP, OCC/UNOCC, COMM)

X13790886-03 (wall; 2-speed)

Figure 36. Unit mtd FSS (OALMH), wall mtd temp sensor (SP, OCC/UNOCC, COMM)

X13511527-01 (wall)
X13790849-01 (unit)
X13651467-01 (comm)

Figure 37. Unit mtd FSS (OALMH), wall mtd display temp sensor (SP, OCC/UNOCC, COMM)

X13790886-04 (wall)
X13790841-02 (unit)

Figure 38. Unit mtd FSS (OLH), wall mtd display temp sensor (SP, OCC/UNOCC, COMM)

X13790886-03 (wall)
X13790475-01 (unit)

Figure 39. Wireless temp sensor (SP, OCC/UNOCC, OALMH, COMM)

X13790492-01 (wall)
X13790855-01 (unit)

Figure 40. Wireless temp sensor with display (SP, OCC/UNOCC, COMM)

X13790822-04 (wall)
X13790855-01 (unit; 3-speed)

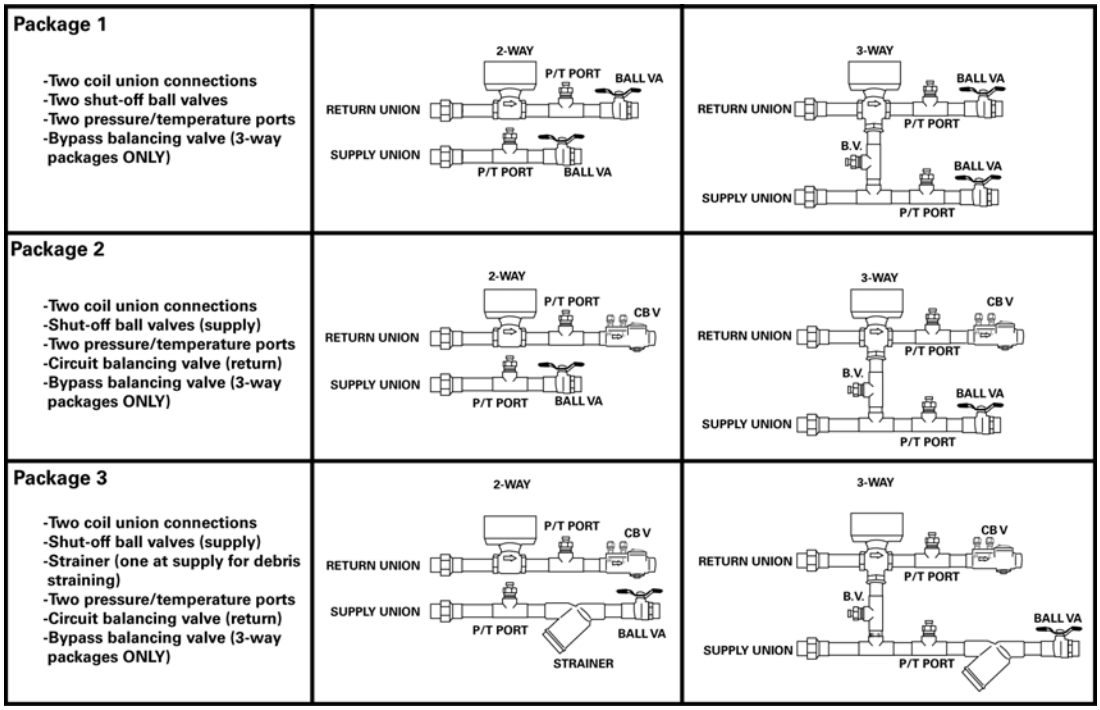
Figure 41. Wireless temp sensor with display (SP, OCC/UNOCC, COMM)

X13790822-01 (wall)
X13790855-01 (unit; 2-speed)

Valves/Piping Package

Control valves are mounted in a factory piping package to include unions at the coil, p/t ports on the supply and return lines, and shut-off ball valve on the supply and return.

Cooling and heating coil valves are only available as 3-point modulating, non-spring return type valves. The ambient temperature range is -32°F to 150°F.



Water Pressure Drops in feet for Unit Vent 2- and 3-way Piping Packages

Table 51. 1.9 Cv-rated valves in 1/2-in. piping packages

Piping package		Cv rating	Gallons per minute					
			2	3	4	5	6	7
1	Basic package	1.9	3.2	7.1	12.6	19.5	28.0	38.1
2	with CBV	1.9	5.2	11.7	20.7	32.3	46.4	63.1
3	with strainer and CBV	1.9	5.5	12.4	22.0	34.2	49.2	66.8

Table 52. 4.7 Cv-rated valves in 1/2-in. piping packages

Piping package		Cv rating	Gallons per minute									
			5	6	7	8	9	10	11	12	13	14
1	Basic package	4.7	4.5	6.3	8.5	11.0	13.7	16.8	20.2	23.9	27.9	32.1
2	with CBV	4.7	17.2	24.7	33.5	43.6	55.1	67.9	–	–	–	–
3	with strainer and CBV	4.7	19.1	27.4	37.2	48.5	61.3	75.5	–	–	–	–

Table 53. 6.6 Cv-rated valves in 3/4-in. piping packages

Piping package		Cv rating	Gallons per minute										
			9	10	11	12	13	14	15	16	17	18	19	20
1	Basic package	6.6	4.8	5.9	7.1	8.4	9.8	11.4	13.0	14.8	16.7	18.7	20.8	23.0
2	with CBV	6.6	16.8	20.7	25.1	29.8	34.9	40.5	46.5	–	–	–	–	–
3	with strainer and CBV	6.6	21.2	26.2	31.7	37.7	44.2	51.2	58.8	–	–	–	–	–

Table 54. Control valve pressure drop (feet)

2- or 3-way water valves	Gallons per minute																		
	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
1/2-in. - 1.9 Cv	2.85	6.42	11.41	17.82	25.67	34.94	–	–	–	–	–	–	–	–	–	–	–	–	–
1/2-in. - 4.7 Cv	–	–	–	2.73	3.93	5.35	6.99	8.84	10.92	13.21	15.72	18.45	21.4	24.56	27.95	–	–	–	–
3/4-in. - 6.6 Cv	–	–	–	–	–	–	–	3.51	4.33	5.25	6.24	7.33	8.50	9.75	11.10	12.53	14.04	15.65	17.34

Table 55. Vertical unit ventilator valve offering

2-position			
2-way		**3-way**	
1/2-in. 2-way, 1.9 Cv	Hydronic - Normally Open - Close off 30 psi	1/2-in. 3-way, 1.9 Cv	Hydronic - Close off 28 psi
3/4-in. 2-way, 3.5 Cv	Hydronic - Normally Closed - Close off 20 psi	3/4-in. 3-way, 7.0 Cv	Hydronic - Close off 10 psi
3/4-in. 2-way, 3.5 Cv	Hydronic - Normally Open - Close off 20 psi		
1.0-in. 2-way, 8.0 Cv	Steam Normally Open - close off 15 psi; 1.0 NPTI		
3-wire modulating			
2-way		**3-way**	
1/2-in. 2-way, 1.9 Cv	Hydronic - Low Cv - heat	1/2-in. 3-way, 1.5 Cv	Hydronic - Low Cv - cooling
1/2-in. 2-way, 3.3 Cv	Hydronic - Low Cv - cooling	1/2-in. 3-way, 3.8 Cv	Hydronic - Med Cv - cool/heat
3/4-in. 2-way, 4.7 Cv	Hydronic - Med Cv - cool/heat	3/4-in. 3-way, 6.6 Cv	Hydronic - High Cv - cool/heat
1.0-in. 2-way, 6.6 Cv	Hydronic - High Cv - cool/heat		
1/2-in. 2-way, 1.8 Cv	Steam Only 1/2 NPTI		
1/2-in. 2-way, 4.6 Cv	Steam Only 1/2 NPTI		
3/4-in. 2-way, 7.3 Cv	Steam Only 3/4 NPTI		
2–10 Vdc modulating			
2-way		**3-way**	
1/2-in. 2-way, 1.9 Cv	Hydronic - Low Cv - heat	1/2-in. 3-way, 1.5 Cv	Hydronic - Low Cv - cooling
1/2-in. 2-way, 3.3 Cv	Hydronic - Low Cv - cooling	1/2-in. 3-way, 3.8 Cv	Hydronic - Med Cv - cool/heat
3/4-in. 2-way, 4.7 Cv	Hydronic - Med Cv - cool/heat	3/4-in. 3-way, 6.6 Cv	Hydronic - High Cv - cool/heat
1.0-in. 2-way, 6.6 Cv	Hydronic - High Cv - cool/heat		

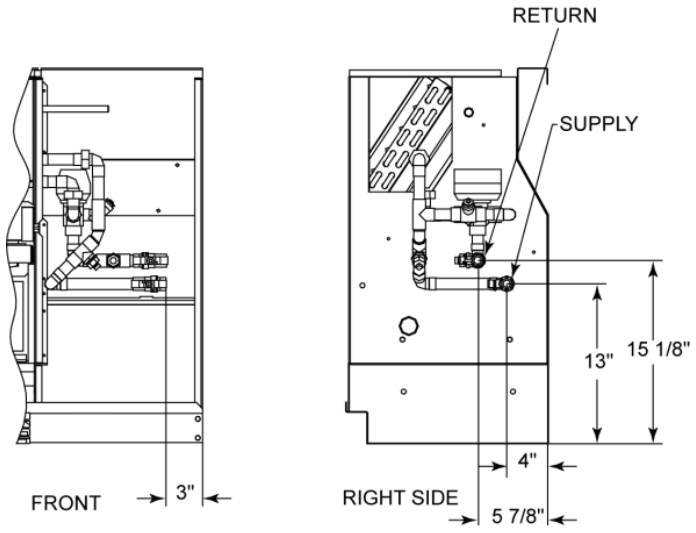
Table 56. 3-Wire modulating water valve specifications

Power supply	24 Vac - 50/60 Hz
Power consumption	4 W
Maximum duty cycle	15%
Nominal timing	120 sec
Operating ambient temperature	0°C to 65°C 32°F to 150°F
Min/Max fluid temperature	1°C to 95°C 34°F to 203°F
Operating pressure differential	Maximum - 4 bar (60 psi)
Pressure rating	Static - 20 bar (300 psi) Burst - 100 bar (1500 psi)
Flow characteristic	Linear

Table 57. Isolation valve specifications

Power supply	24 Vac - 50/60 Hz
Power consumption	5 W
Maximum fluid temperature	94°C 200°F
Minimum fluid temperature	1°C 34°F
Maximum operating pressure	300 psi
Maximum close-off pressure	1/2 in. = 30 psi 3/4 in.= 20 psi 1 in.= 15 psi

Figure 42. Dimensional data for right hand piping with 3-way valve (typical)



Face and Bypass Damper Actuator

An optional face and bypass actuator is 24 volt, 3-point modulating, non-spring return. In-coming power is 24 Vac with a consumption of 2 watts. Maximum torque of 35 in·lb.

Note: *Face and bypass is available with all units ventilator coils, with exception of DX and electric heat.*

Table 58. Face and bypass actuator specification

Power supply	24 Vac ±20% - 50/60 Hz 24 Vac ±10%
Power consumption	2 W
Transformer sizing	3 VA (class 2-power source)
Angle of rotation	Maximum 95°, adjustable with mechanical stop
Torque	35 in·lb
Direction of rotation	Reversible with switch L/R
Position indication	Clip-on indicator
Run time (nominal)	90-second constant
Manual override	External push button
Noise level	Less than 35 dB
Control signal	3-point floating

Outside/Return-Air Damper Actuator

Optional outside-air/return-air actuator is spring return and takes a 3-point floating signal. A 2–10 Vdc option is also available. It provides 25 in·lb of torque. The power consumption is 7 VA with temperature limits of -25°F to 125°F.

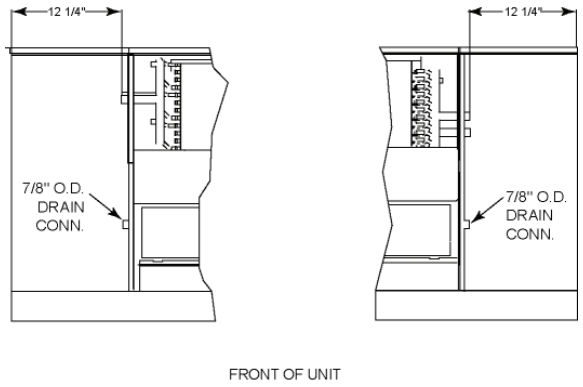
Table 59. Outside air actuator specifications

Power supply	24 Vac ±20% - 50/60 Hz 24 Vac ±10%
Power consumption	Running: 2.5 W Holding: 1 W
Transformer sizing	5 VA (class 2-power source)
Overload protection	Electronic throughout 0 to 95° rotation
Control signal	2 to 10 Vdc 3-point floating with Trane® controls
Angle of rotation	Maximum 95°, adjustable with mechanical stop
Torque	35 in·lb
Direction of rotation	Spring return reversible with CW/CCW mounting
Position indication	Visual indicator, 0 to 95°
Run time (nominal)	90-second constant (independent of load)
Noise level	Running: 30 dB

Jobsite Connections

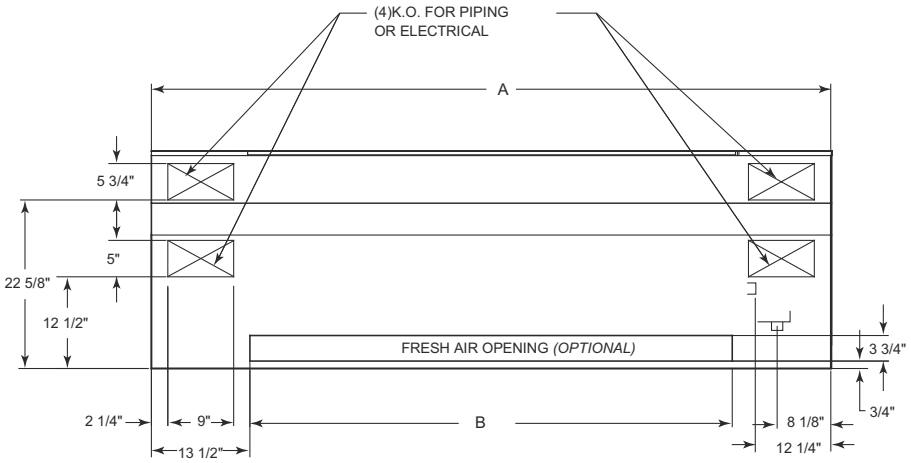
Coil Type/Specification	Header Sizes
Hydronic Main/Auxiliary Reheat Coils *(Cooling Coil or Heating/Cooling Changeover Coil)* • Wavy plate finned. • Hydrostatically tested at 350 psig. • All piping packages for the main coil and auxiliary reheat coil assemblies are always supplied as a 3/4 in. package.	• 3/4 in. Nominal • 7/8 in. ID
Hydronic Auxiliary Preheat Coils *(Heating Coil)* • Wavy plate finned. • Hydrostatically tested at 350 psig. • All piping packages for the auxiliary preheat coil assemblies are always supplied as a 1/2 in. package.	• 1/2 in. Nominal • 5/8 in. I.D.
Steam Heating Coils • 1-row, tube-in-tube distributing coil. • Piping packages for steam coils are field provided. • Equipment specified with Trane controls will benefit from an optional 2-position isolation valve (Main Coil) to be used for close-off of the steam coil when the damper is in full bypass position. • The modulating piping valve (option) is shipped loose and field installed.	• 1 in. FNPT
Electric Heat Coils • Electric preheat coils consist of special finned element for maximum life, heat transfer and safety. • Units include a high temperature cut-out with a continuous sensing element. This device interrupts electrical power whenever excessive temperatures are sensed along the leaving air side of the coil. • Power connection is made in the right-hand end pocket. • A circuit breaker option is available through the equipment model number.	
Direct Expansion (DX) Coils *(Refrigerant Cooling Coil)* • The DX refrigerant coil includes a factory mounted thermal expansion valve (TXV) and equalizing tube, 24 Vac transformer, time delay relay, frost detection, outside air sensor. • TXV is sized for R-410A refrigerant. The type of coil is order specific through the unit model number selection.	• 3/8 in. OD liquid line • 7/8 in. OD suction line

Figure 43. Coil header location

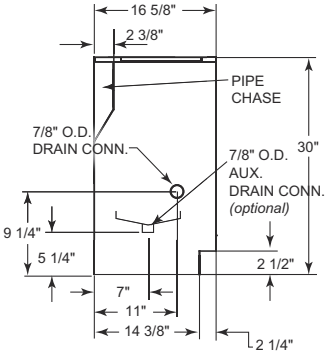


Dimensional Data

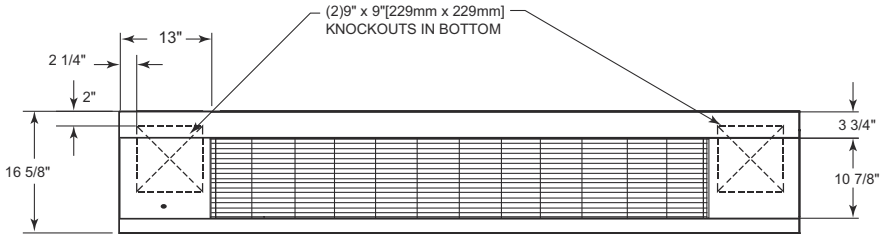
Standard Depth Unit



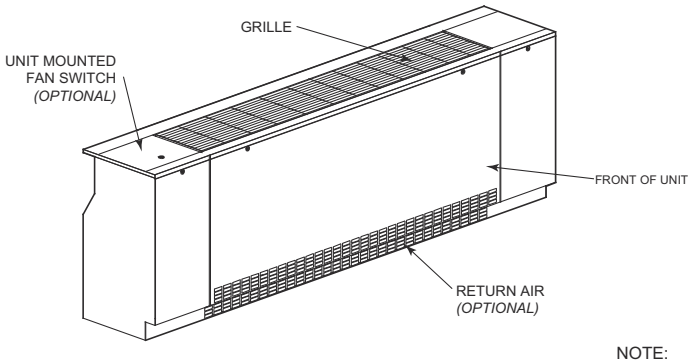
BACK VIEW



SIDE VIEW



TOP VIEW



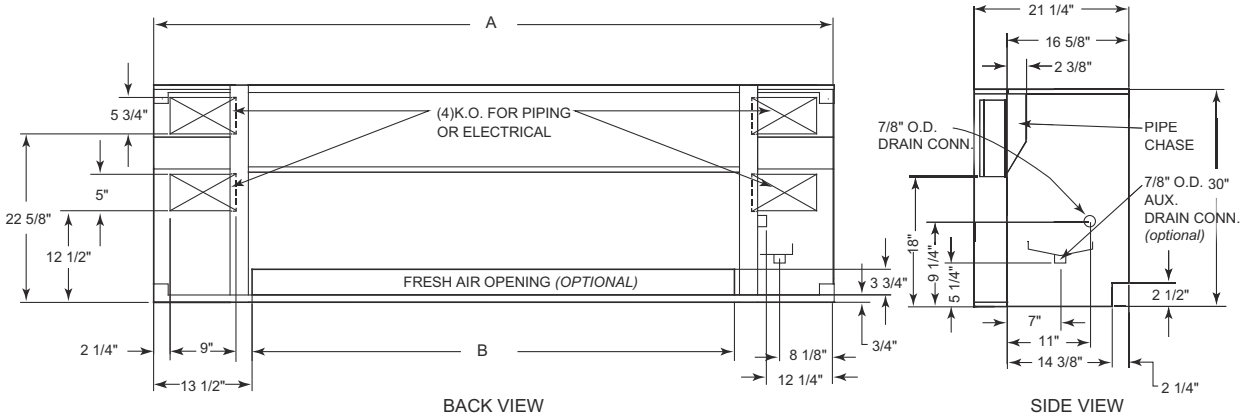
UNIT SIZE	NO. FANS	A	B
075	2	69"	42"
100	2	81"	54"
125	4	93"	66"
150	4	105"	78"

NOTE:

1. THE UNIT LENGTH DOES NOT INCLUDE 5/8" END PANELS.

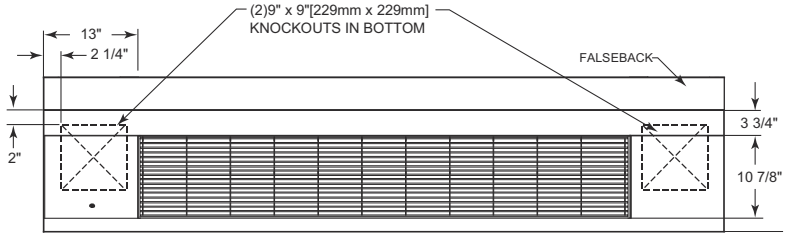
2. THE POWER CONNECTION IS MADE IN THE LEFT HAND END POCKET FOR ALL OPTIONS BUT ELECTRIC HEAT.

3. THE POWER CONNECTION FOR ELECTRIC HEAT OPTION IS MADE IN THE RIGHT HAND END POCKET.

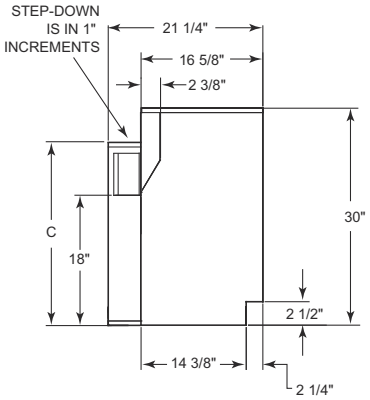


BACK VIEW

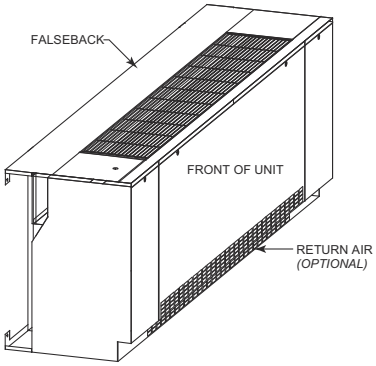
SIDE VIEW

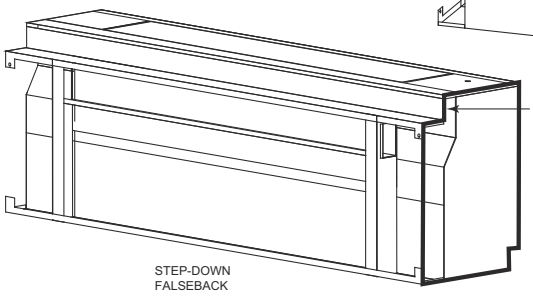


TOP VIEW



SIDE VIEW
Depicting Step-down
Falseback





UNIT SIZE	NO. FANS	A	B	C
075	2	69"	42"	25" to 29"
100	2	81"	54"	25" to 29"
125	4	93"	66"	25" to 29"
150	4	105"	78"	25" to 29"

NOTE:

1. THE UNIT LENGTH DOES NOT INCLUDE 5/8" END PANELS.

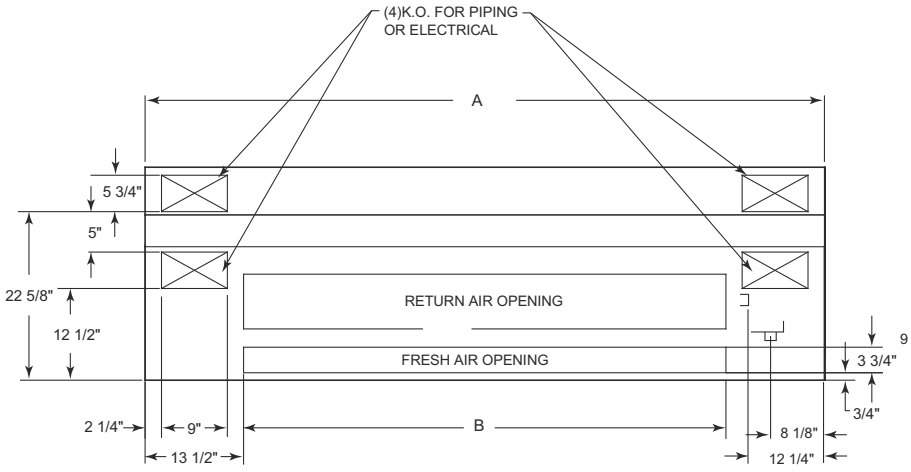
2. THE POWER CONNECTION IS MADE IN THE LEFT HAND END POCKET FOR ALL OPTIONS BUT ELECTRIC HEAT.

3. THE POWER CONNECTION FOR ELECTRIC HEAT OPTION IS MADE IN THE RIGHT HAND END POCKET.

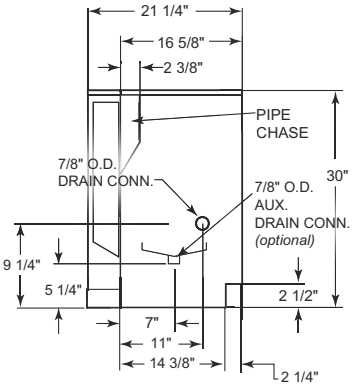
4. THE UNIT SHOWN INCLUDES THE INSULATED HORIZONTAL BAFFLE OPTION.

Dimensional Data

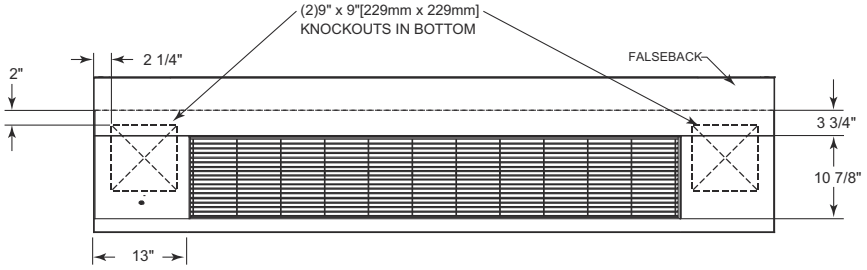
Dynamic Air Barrier Unit



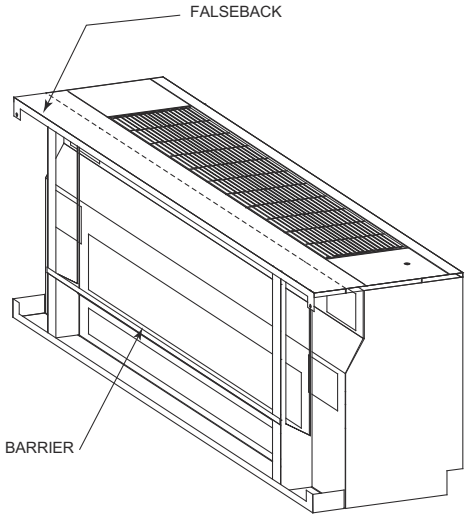
BACK VIEW



SIDE VIEW



TOP VIEW



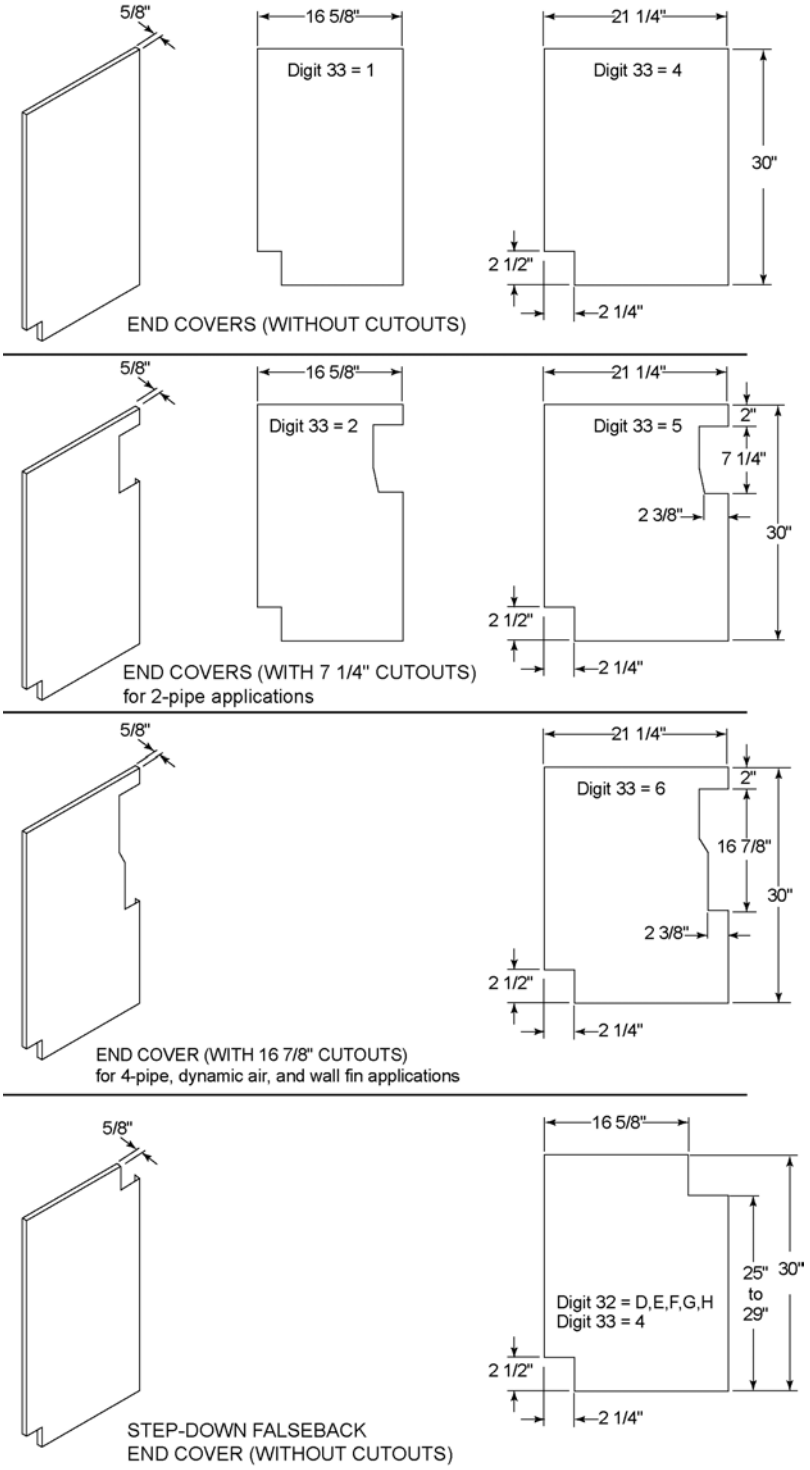
UNIT SIZE	NO. FANS	A	B
075	2	69"	42"
100	2	81"	54"
125	4	93"	66"
150	4	105"	78"

NOTE:

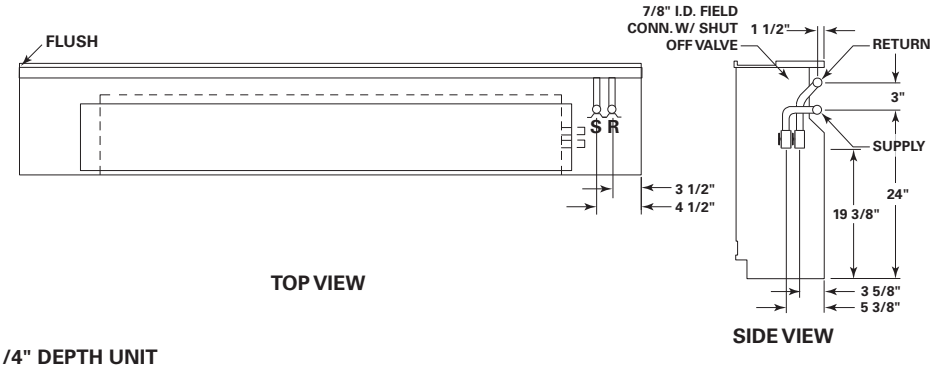
1. THE UNIT LENGTH DOES NOT INCLUDE 5/8" END PANELS.

2. THE POWER CONNECTION IS MADE IN THE LEFT HAND END POCKET FOR ALL OPTIONS BUT ELECTRIC HEAT.

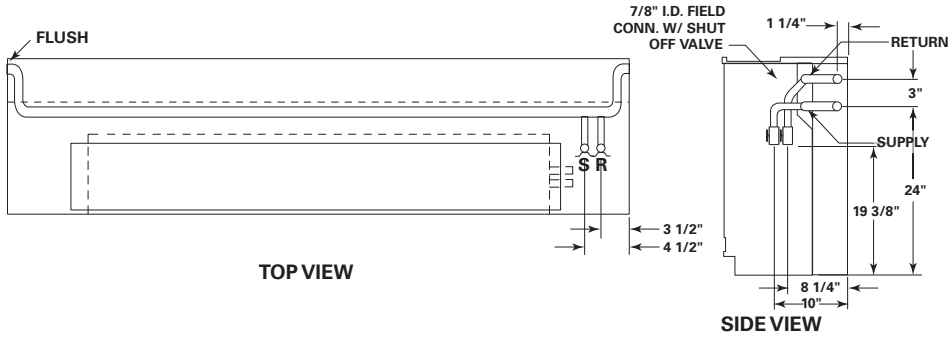
3. THE POWER CONNECTION FOR ELECTRIC HEAT OPTION IS MADE IN THE RIGHT HAND END POCKET.


5/8"
16 5/8"
Digit 33 = 1
21 1/4"
Digit 33 = 4
30"
2 1/2"
2 1/4"
END COVERS (WITHOUT CUTOUTS)
5/8"
16 5/8"
Digit 33 = 2
21 1/4"
Digit 33 = 5
2"
7 1/4"
2 3/8"
30"
2 1/2"
2 1/4"
END COVERS (WITH 7 1/4" CUTOUTS)
for 2-pipe applications
5/8"
21 1/4"
Digit 33 = 6
2"
16 7/8"
30"
2 3/8"
2 1/2"
2 1/4"
END COVER (WITH 16 7/8" CUTOUTS)
for 4-pipe, dynamic air, and wall fin applications
5/8"
16 5/8"
25" to 29"
30"
Digit 32 = D,E,F,G,H
Digit 33 = 4
2 1/2"
2 1/4"
STEP-DOWN FALSEBACK
END COVER (WITHOUT CUTOUTS)

16 5/8" DEPTH UNIT



21 1/4" DEPTH UNIT



Note: *1-3/8 in. OD and 2-1/8 in. OD crossover piping*

- *Crossover piping is available for all 2- or 4-pipe coils selections. Trane provides the crossover for the hot water only. The crossover pipe is factory-insulated with 3/8 in.-thick insulation.*
- *Expansion compensation between the factory piping package and the crossover piping is achieved using a flex hose rated at 250 psi working pressure. Flex hose is only available with factory-mounted piping packages.*
- *Expansion compensation for the crossover piping must be handled external to the unit ventilator.*
- *Crossover connections terminate in the same end pocket as the heating coil on all 2- and 4-pipe coils.*

Mechanical Specifications

General

Deliver and install a complete unit ventilator certified for ventilation at AHRI-840, or tested by an independent testing and balancing lab witnessed by owner's representative.

Safety

All standard units are UL-listed in the United States and Canada and comply with NFPA 90A requirements.

The unit ventilator is certified or rated in accordance to the following listings for performance proof and safety: ETL, AHRI-840, AHRI-350, LonMark®, BACnet®

Equipment Construction

Exterior cabinetry is constructed of heavy-gauge metal for strength and durability. All exposed edges shall be rounded to safeguard against injury. All interior sheet metal shall be of galvanized steel to restrain against deterioration.

The front plane of the unit consists of a three panel design. The control compartment is accessible without removing the entire front panel. The discharge air grille contains rounded edged steel bars, and are placed at a 15° slope to provide proper airflow deflection.

Access for inspection and cleaning of the unit drain pan, coils, and fan section is provided. The unit shall be installed for proper access. Procedures for proper maintenance of the unit shall is included in the installing, operation manual.

Cabinet insulation is closed cell to maximize thermal performance. It is suitable for use in air streams up to 4500 feet per minute (fpm). Insulation will meet the Underwriters Laboratories Fire Hazard Classification and long term thermal resistance (LTTR) classification per CAN/ULC S770 standard.

Piping and control end pockets are a minimum of 12 inches wide to facilitate piping, auxiliary drain pan, and service access.

Final finish of the cabinet is cleaned, phosphatized and painted with an electrostatic powder spray system, with a minimum thickness of 1.5 mil to avoid visible runs and resist abrasion.

Unit Fans

The unit fan board assembly shall ship from the factory wired to the commission schedule for engineered cfm expectancy. A motor speed switch is on the unit or wall for motor speed adjustment.

The fan board is a single, rigid construction, made from corrosion resistive material. It is a trouble-free slide design to provide cleaning and serviceability ease to maintenance personnel.

The fans contain a double width/double inlet, forward curved centrifugal design to sustain appropriate air throw into the space. The wheels are galvanized metal to resist corrosion. The dynamically balanced fan and motor are of direct drive style.

The fan and coil arrangement are of a blow-thru configuration to supply unvarying coil face velocity avoiding cold spots on the coil.

Motors

All motors are brushless DC (BLDC)/electronically commutated motors (ECM) factory-programmed and run-tested in assembled units. The motor controller is mounted in a touch-safe control box with a built-in integrated user interface and LED tachometer. If adjustments are needed, motor parameters can be adjusted through momentary contact switches accessible without factory service personnel on the motor control board. Motors will soft-ramp between speeds to lessen the acoustics due to sudden speed changes. Motors can be operated at three speeds or with a field-supplied variable speed controller. The motor will choose the highest speed if there are simultaneous/conflicting speed requests. All motors have integral thermal overload protection

with a maximum ambient operating temperature of 104°F and are permanently lubricated. Motors are capable of starting at 50 percent of rated voltage and operating at 90 percent of rated voltage on all speed settings. Motors can operate up to 10 percent over voltage.

Drain Pan(s)

The unit drain pan consists of a corrosion resistant, environmentally friendly, dual sloped design to facilitate condensate removal quickly. The pan is removable for cleaning. Hook-up to the drain pan for condensate removal is made on the cooling coil union side. The drain side connection shall be easily field-inverted by removing and rotating the pan 180°.

An auxiliary drain pan *(optional accessory)* is factory-provided, and field-installed under the main, cooling piping package. It is constructed of the same corrosion resistance material found in the main unit drain pan. The auxiliary pan will effortlessly fit into the end pocket for condensate disposal of the piping package.

Hydronic Coils *(option)*

All hydronic coils are a plate-fin type, mechanically bonded to tubes. The coils are hydrostatically tested to 350 psig and burst tested to 450 psig. The coils are rated in accordance with AHRI-840. A threaded drain plug is provided at the header's lowest point, and a manual air vent provided at its highest point.

The standard 4-pipe heating coil is placed in the preheat location. Optional 4-pipe heating coils are available in the reheat position for dehumidification control.

Refrigerant Coils *(option)*

Direct expansion coils contain copper tubes mechanically expanded into evenly spaced aluminum fins. All coils are proof and leak tested before leaving the manufacturer. The proof test is performed at 1.5 times the maximum operating pressure, and leak tested at the maximum operating pressure. In addition, the tubes are completely evacuated of air to check for leaks in the vacuum.

The refrigerant coil distributor assemblies is Venturi or orifice style with round copper distributor tubes.

Distributors are sized consistently with capacity of coil. Suction headers are fabricated from round copper pipe.

A thermostatic expansion valve (TXV) is factory selected and installed for a wide-range of control to maintain optimum control of superheat. All coils are shipped with a dry nitrogen holding charge.

Electric Coil *(option)*

Units equipped for electric heat contain a special resistance, heating element design inserted in an extended surface fin-tube bundle for maximum element life and safety. Units specifying electric heat include (as standard) a high temperature cut out with a continuous sensing element. This device interrupts electrical power whenever excessive temperatures are sensed anywhere along the leaving side of the coil. A contactor (also provided) ensure positive disconnect of electrical power whenever the fan motor power is interrupted. All electric heat units have a power wiring console in the right hand end-pocket to better facilitate field wiring of the unit.

Steam Coil *(option)*

Units including a steam coil are of a 5/8-inch, sigma-flow, tube-in-tube, distributing coil design. Steam coil tubing is mechanically expanded into evenly spaced aluminum fins. The supply and return connections are on the same side, and include a 1-inch female pipe thread (FPT) termination. The coil is pitched by the manufacturer to provide condensate drainage for freeze protection.

Outside Air/Return Air Damper

Each unit ventilator is equipped with a linkage free, air-tight damper design. This linkage free design results in a fixed air seal of the damper assembly.

Face and Bypass Damper *(option)*

The face and bypass damper control is utilized for economizing and dehumidification of the equipment during seasonal or morning warm-up. The damper is constructed of aluminum grade metal. The damper is tightly sealed and designed to minimize heat pickup in the bypass position.

Controls

Controls options are: unit-mounted fan speed switch, customer supplied terminal interface (CSTI), Tracer ZN520, and Tracer UC400. A variety of inputs and outputs are available for the CSTI and Tracer controller options. A disconnect switch (for non-electric heat units), fused transformer, contactor(s), and terminal strip are provided with the CSTI and Tracer controller options.

Customer Supplied Terminal Interface (CSTI)

The control interface is intended to be used with a field-supplied, low-voltage thermostat or controller. The control box contains a relay board which includes a line voltage to 24-volt transformer, and an optional disconnect switch. All end devices are wired to a low-voltage terminal block and are run-tested, so the only a power connection and thermostat/controller connection is needed to commission the unit. Changeover sensors and controls are provided whenever a change-over coil is selected. When N.O. valves are selected, inverting relays are provided for use with standard thermostats.

Unit-mounted Fan Speed Switch (FSS)

The fan speed switch is available with or without the control interface option. The unit-mounted FSS will employ a low-voltage fan switch. The low-voltage fan speed option will provide an interface to factory wiring, including variable speed/high-medium-low (HML) control. The control box contains a line voltage to 24-volt transformer, EC motor controller, and an optional disconnect switch.

Tracer ZN520

The Tracer ZN520 discrete speed controller can be used in a stand-alone application or used as part of a Trane Integrated Comfort System (ICS) with LonTalk® communication. The Tracer ZN520 offers the combined advantages of simple and dependable operation. Standard control features include options normally available on more elaborate control systems. All control options are available factory-mounted, -wired, and -configured and can also be field-configured using a service tool.

Tracer UC400

The Tracer UC400 controller delivers single zone VAV control in a stand-alone application or as part of a Trane Integrated Comfort system with BACnet® communication. The Trace UC400 offers the combined advantages of a factory-mounted, -wired, and -programmed controller for dependable out-of-the box operation. Standard control features include options normally available on more elaborate control systems. All control options are available factory-programmed with additional configuration and programming in the field using a service tool.

Zone Sensors (option)

Trane offers a full line of wired and wireless temperature sensors. Wired temperature sensors are the suitable alternative for locations that cannot accommodate wireless sensors or that require a service tool connection. Wireless temperature sensors, which provide easy and flexible installation, are a cost-effective alternative to wired sensors.

Some additional options available with the sensors include:

- Easy-to-use display interface for clear and simple monitoring and control.
- Temperature setpoint control to allow the tenant to choose a temperature setpoint that satisfies their personal preference.
- Fan speed switch to allow the tenant to locally control the fan speed to better satisfy their preference.

- Occupancy override to allow the tenant to request temporary timed override system operation that keeps the building conditions in occupied comfort conditions.
- COMM module that is compatible with all Trane® wired temperature sensors. This accessory provides a local RJ22 connection to Trane® service tools for easy, low-cost maintenance.

Filter

Units equipped with a standard throwaway filter have an average resistance of 76 percent and dust holding capacity of 26 grams per square foot.

Units equipped with 1-in. MERV 8 filters have a rating based on ASHRAE Standard 52.2. The average dust spot efficiency is no less than 35 to 40 percent when tested in accordance with ASHRAE Standard 52.1 atmospheric dust spot method.

Units equipped with 1-in. MERV 13 filters have a rating based on ASHRAE Standard 52.2. The average dust spot efficiency is no less than 90 percent efficiency on 1–3 micron particles and greater than 90 percent efficiency on 3–10 micron particles when tested in accordance with ASHRAE Test Standard 52.2.

Trane optimizes the performance of homes and buildings around the world. A business of Ingersoll Rand, the leader in creating and sustaining safe, comfortable and energy efficient environments, Trane offers a broad portfolio of advanced controls and HVAC systems, comprehensive building services, and parts.
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Supersedes UV-PRC003-EN (20 Dec 2012)

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